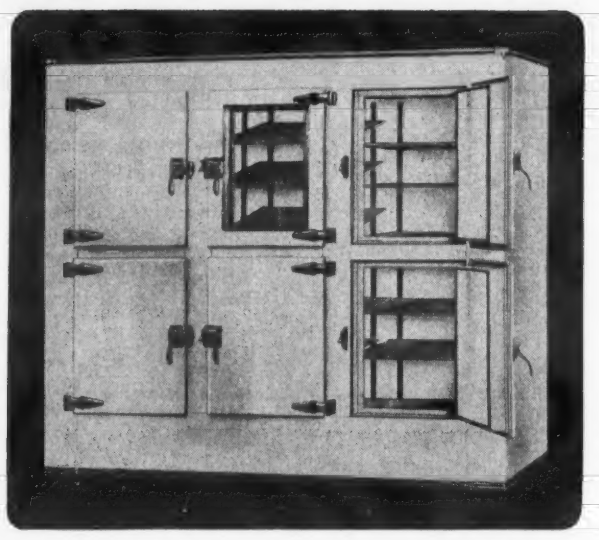
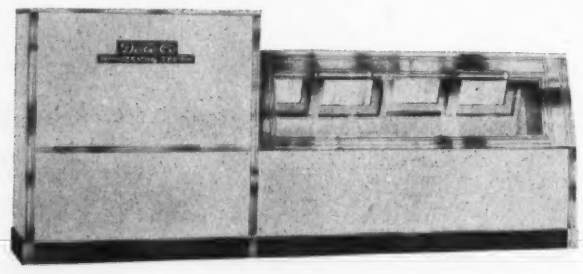
Meeting All the Requirements of Quick Frozen Foods

DoleCo Sub-Zero System of Refrigeration

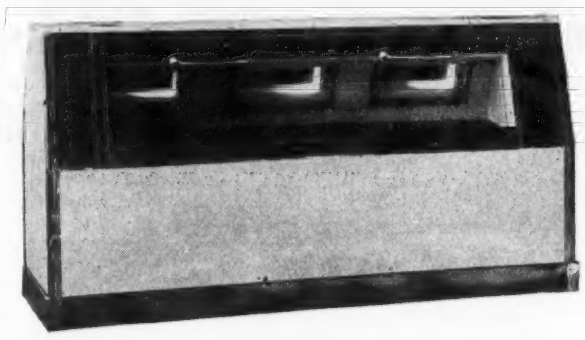


Wall Storage Box. Width 84 in. Depth 39¾ in. Height 72 in.

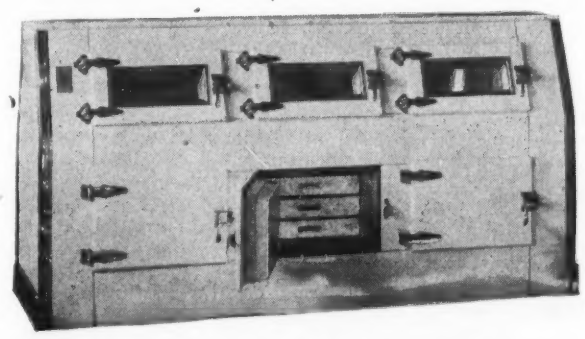


Combination Display Case and Storage Cabinet

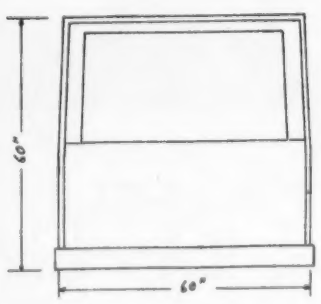
Combination Display Case and Storage Cabinet installed in the Thrift store at 719 Sumner Avenue, Springfield, Mass., for the merchandising of Birdseye Frosted Foods. Fourteen square feet of display—ample storage for 850 to 1000 pounds.



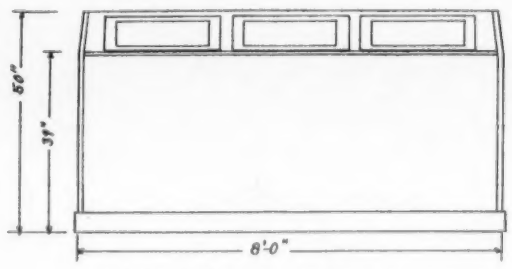
Front View—This sturdily constructed display counter can be furnished in 6, 8 and 10-foot lengths. Temperature at top of merchandise line can be constantly maintained at 5° to 10° F. in the hottest weather.



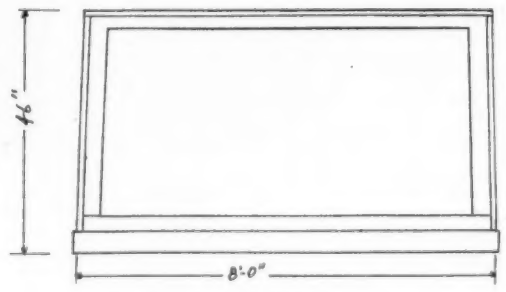
Rear View—Showing storage compartment beneath display counter. Here a Sub-Zero temperature is constantly maintained.



DoleCo Delicatessen Display Case
35" d. at bottom

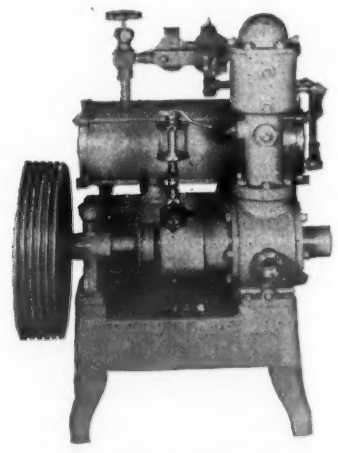


DoleCo Self-Service Display Case
One Type—34½" d. at bottom
One Type—56½" d. at bottom



DoleCo Full Vision Display Case
34" d. at bottom

Special service cases equipped with the DoleCo Sub-Zero Systems are now available. Sketches above indicate the dimensions and type of construction of some of these cases.



DoleCo Ammonia Refrigerating Machine designed for the Sub-Zero System of refrigeration.

To successfully refrigerate quick-frozen foods it is not only necessary to obtain extremely low temperatures but positive control of humidity, control of frosting and control of air circulation are essential. These new and rigid requirements are met completely by the DoleCo Sub-Zero System of refrigeration, a truly scientific development.

CONSTANT LOW TEMPERATURES — Display counter temperature need never be higher than plus 5°F. Temperatures in storage compartments can be held at 10° to 20° below zero if desired. These temperatures are under accurate thermostatic control.

NO DEHYDRATION—The special design and construction of all units practically eliminate all air circulation. Dehydration of foods is completely prevented—all the natural flavors and juices are retained.

NO MORE DEFROSTING—Since no moisture is extracted from foods and there is no circulation of moist air, the defrosting problem is entirely absent. There is no accumulation of frost in either display case or storage compartments. Loss from food spoilage is avoided.

COMPLETE INSTALLATIONS AND COMPLETE RESPONSIBILITY — DoleCo, with its unquestioned reputation, stands squarely behind every installation including DoleCo Ammonia Refrigerating Machine, and DoleCo Storage and Display Cabinets equipped with the new Sub-Zero System.

SEND FOR FULL DETAILS ABOUT THE DOLECO SUB-ZERO SYSTEM AND COMPLETE LINE OF EQUIPMENT

DOLE REFRIGERATING MACHINE CO.

1209 WASHINGTON BOULEVARD, CHICAGO, ILLINOIS

15,000 Copies

Merchandising Section

In Three Parts—Part 1

UNIVERSITY OF CALIFORNIA LIBRARY BRANCH OF THE COLLEGE OF AGRICULTURE

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, No. 14, SERIAL No. 116

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DETROIT, MICHIGAN, MARCH 11, 1931

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TWO DOLLARS PER YEAR

GENERAL ELECTRIC, FRIGIDAIRE ANNOUNCE THREE-YEAR GUARANTEE

Biechler Presents New Two-Cylinder Models

Dayton—A three-year guarantee covering both the cabinet and refrigerating machine of the 1931 Frigidaire household line has just been announced by E. G. Biechler, president of the Frigidaire Corp. This announcement follows the introduction of eight new household models, and a complete commercial line. Two-cylinder compressors are featured in the 1931 line. Cabinets for the household models are finished inside and out in white porcelain-on-steel, and have legs, as contrasted with previous legless and two-color finish models. List prices on the household line range from $180 to $618 f. o. b. Dayton.

"This dual guarantee is the broadest in the history of the Frigidaire Corp.," states Mr. Biechler. "We have been able to adopt it because of the experience we are having with current Frigidaires."

An addition of some 1,500 employees to the factory payroll, bringing the total number of employees to 7,500, has been made to take care of the March production schedule, which is increased 26 per cent over that of February.

Mr. Biechler reports a sales increase in February of 44 per cent over the same month in 1930, and an increase of 106 per cent over sales in January, 1931.

At a series of 45 district business conferences held in key cities of the nation the new Frigidaire models were introduced to dealers. These models are now being placed on display in showrooms throughout the country.

"Reports from these meetings," declares Mr. Biechler, "indicate a decided upturn in our business during the coming months. Our dealers and salesmen view the spring selling season with optimism, and we are convinced that 1931 will be a good year for electric refrigeration."

One of the claims advanced for the new two-cylinder compressors is shortened running time, faster freezing time, and increased ice cube capacity. Radiator type condensers are employed.

Interior linings of the cabinet are

(Concluded on Page 12, Column 5)

Sales

Beginning with this issue, Part 1 of the NEWS will be labeled Merchandising Section.

Inasmuch as industry news and other information will be included in Part 1, the term, "Merchandising Section" does not adequately cover the full scope of editorial matter which will appear.

Business men, however, are accustomed to thinking in terms of merchandising, and much of the material in this section can be construed as belonging to the realm of sales.

STARR BUYS BENEDICT; GETS COAST DISTRIBUTION

Los Angeles—Following closely upon the heels of the purchase of the Coast Refrigeration Co., which has been making Polar Wave commercial and multiple system refrigerating machines, by Benedict & Co., Ltd., manufacturer of Benedict Yukon electric refrigerators, comes the announcement that the Starr Co. of Richmond, Ind., has bought a controlling interest in Benedict & Co.

At present, according to Barry Benedict, vice-president and general manager of Benedict & Co., the latter concern will continue to merchandise its Yukon line, and will distribute Starr Freeze domestic units on the Pacific Coast.

Refrigeration equipment made by the Coast Refrigeration Co., which was purchased from R. E. Allen, trustee, for $50,000, will also be sold by the Benedict organization.

The Bedell Engineering Co. has been making the commercial compressors and freezing coils sold under the Yukon trade name.

Officers of the reorganized Benedict & Co., Ltd., are Ray Strahan, president; Harry Benedict, vice-president and general manager; and H. L. Noder, secretary and treasurer. Strahan is vice-president of the Starr Co., and Noder is also with that organization.

KELVINATOR SHIPMENTS CONTINUE TO INCREASE

Detroit—February Kelvinator shipments increased 11 per cent over February of 1930 and showed a gain over February, 1929, according to H. W. Burritt, vice-president in charge of sales.

DUAL MERCHANDISING COMMITTEE FORMED

New York City—Following preliminary conferences at the invitation of the National Retail Dry Goods Association, a committee of six representatives named by that association met here recently with six named by the National Electric Light Association, for consideration of electrical merchandising in its various aspects.

The conference concluded to crystallize itself into a standing committee to be known as the Electrical Merchandising Joint Committee.

It was agreed that a survey and factual study of merchandising of household electrical appliances will be commenced at once by this joint committee, the expense to be equally shared, and that the joint committee will continue to function indefinitely, convening as may be necessary to receive reports from the survey or to give direction for its conduct.

The scope and purposes of the survey will be as follows:

(a) To make a factual study of merchandising of household electrical appliances, and of the policies and practices now followed by the constituents repre-

(Concluded on Page 4, Column 4)

Top 'Topper'

ALBERT MATSINGER
of Philadelphia, again leads all G. E. household salesmen

STOCKHOLDERS O. K. MAJESTIC PURCHASE

Chicago, March 11.—Five o'clock this afternoon will mark the demise of Majestic Household Utilities Corp. After that time Majestic refrigerators will be made and sold by the Grigsby-Grunow Co.

Stockholders of both corporations yesterday approved the transfer of Majestic assets to Grigsby-Grunow on a share-for-share basis.

It was announced at the stockholders' meetings that $3,000,000 of the $5,000,000 in bonds recently floated to discharge obligations to creditors and provide working capital had been subscribed.

The bulk of the remainder will be held for stockholders who wish to exercise their privilege of subscribing.

ICE SHORTAGE WILL HELP SALES, BAKER PREDICTS

Omaha—"Scarcity of natural ice this season will prove to be a boon to refrigerating machine manufacturers in this section in 1931," J. L. Baker, president of the Baker Ice Machine Co., told a semi-annual sales convention of his company here last week.

Managers and representatives from Nebraska, Iowa, Missouri, Kansas, Oklahoma, Colorado, Wyoming, North and South Dakota, Minnesota, and Wisconsin attended.

Introduced at the convention were the Baker utility cooler—a combination refrigerating, ice making, and milk cooling machine—and the Baker cold water unit.

Warranty Made Keynote Of Annual Convention

By George F. Taubeneck

Cleveland—"A three-year guarantee." That was what more than 700 distributors, "Toppers," and other members of the General Electric refrigeration organization, who gathered from all quarters of the land to attend the "Monitor Top" convention here February 25 and 27, heard Manager P. B. Zimmerman announce as the sales keynote for the coming year.

Throughout the well-balanced program of speeches, demonstrations, playlets, moving pictures, and feasts this "three-year guarantee" was a note both dominant and sustained.

The theme was introduced visually at first, immediately after a film, "The Trail Blazer," had been shown to a packed audience of "Toppers" and distributors in Cleveland's Little Theatre.

Flashing "3" signs of various sizes ranged against a dark background dazzled the entire group until Manager Zimmerman appeared to make the welcoming address.

Apparently a group of electric light experts corraled out at Nela Park had been turned loose on the settings for this convention, for this startling electric display was but the first of a whole series of original and striking visual presentations offered during the course of the two-day convention.

Zimmerman received an ovation lasting several minutes when he made his appearance on the stage.

Calmly, confidently, with crisp sentences and without gestures, he told the assemblage that the refrigeration industry had helped buoy up America's business and industrial life during 1930 by its remarkable sales record.

"Business as a whole was 32 per cent behind 1929 last year," he said. "Yet our industry was far ahead of its 1929 mark. Thus we rendered a great public service by helping to relieve unemployment and by keeping money in circulation.

"I believe economic recovery is at hand. We should do an even greater business in 1931. The public is becoming more and more sold on the merits of electric refrigeration, and all we have to do is carry our story to them.

"Here in the General Electric Co. we

(Concluded on Page 2, Column 1)

Service

ELECTRIC REFRIGERATION NEWS presents with this issue its first Engineering Section.

Printed on readable green paper. Part 3 will be devoted to the interests of service and installation men, production engineers, and manufacturers of refrigeration materials, parts, and accessories.

Included in this section, which will appear with every other issue of the NEWS, will be information on patents, designing, production, testing, estimating installation, inspection, and service.

CHICAGO ICE FIRMS PROTEST ORDINANCE

Chicago—Six ice-manufacturing companies here have brought suit to have the Chicago refrigeration ordinance set aside as being "wholly unconstitutional, illegal, and void, not uniform in its provisions, and discriminatory."

Brought by the Consumers Co., Lincoln-Boyle Ice Co., Eagle Ice Co., Jefferson Ice Co., Midwest Ice Co., and West Side Ice Co., the suit is directed against the City of Chicago, William Hale Thompson, Mayor; John H. Alcock, Commissioner of Police; V. S. Petterson, Deputy Comptroller, and George E. Nye, Chief Inspector of the Department for Inspection of Steam Boilers, Unfired Pressure Vessels and Cooling Plants of the city of Chicago.

The suit has two purposes, according to Gerald F. Gearon of the Boiler Inspection Department, who will direct the reply of the city administration to the suit.

To secure a reduction of the $20 inspection fee for each compressor over 50 tons capacity, which the bill charges is "unreasonable, excessive, and exorbitant," is the first purpose.

The second purpose of the suit, Gearon

(Concluded on Page 19, Column 1)

RICE IN RECEIVERSHIP; DISTRIBUTOR BUILDS UNITS

Detroit—Rice Products, Inc., of Michigan, is now in the hands of a receiver. The factory and offices located at 311 Beaubien have been vacated and closed.

"It is possible," states I. L. Rice, Jr., president of the organiztion, "that a reorganization will be effected in the comparatively near future; but to date our plans are not completed."

Rice Electric Refrigeration, Inc., of Brooklyn, N. Y., a former distributor of Rice Products, Inc., is now servicing Rice electric refrigerators in that territory, and is building new refrigerating units for delivery to other distributors.

Experiments with low temperature equipment are being continued. A display case and machine are now in the testing laboratories of Batchelder, Snyder, Dorr & Doe in Boston, and another display case is being prepared.

FLINTLOCK OFFICIAL STAFF STILL REMAINS UNCHANGED

Detroit—Curtailed overhead costs and plans to market more heat-exchanging parts for the electric refrigeration industry were decided upon at the New York executive meetings of the Flintlock Corp., according to H. I. Phillips, sales manager of the organization.

Executive changes occasioned by the death of Carl H. L. Flintermann, former president, have not yet been announced. Production of evaporators and condensers will continue as before.

Grunow, Associates Form Group in Chicago to Manufacture Electric Refrigerator, Radio; Plan Showing in June

By George F. Taubeneck

Chicago—Grunow electric refrigerators and radios will be placed on the market before the end of summer, according to James J. Davin, advertising and sales promotion manager of the newly formed Grunow Group.

The former president of the Grigsby-Grunow Co., and Majestic Household Utilities Co., has established offices and a laboratory in the new LaSalle-Wacker building here, and is making preparations to re-enter both the radio and refrigeration fields.

Associated with Grunow are a number of young men who were Majestic executives until Grunow left the organization.

Among these are Herbert E. Young, former sales manager; James J. Davin, former sales promotion manager; A. E. Winan, former vice-president and purchasing agent; M. W. Kenny, former assistant chief radio and refrigerator engineer; A. R. Perry, former factory superintendent; D. Jordan, former chief of the tube plant; Charles Henry, former chief inspector; F. A. Delano, former chief of the sales school; Harry H. Bailey, former manager of the traveling department; Vincent Corcoran, Sid Arneson, F. M. Edwards, and H. Schaffer.

Under the direction of Kenny, who had charge of the design and development of the design and development of all Majestic receivers since models 71 and 72, and of the Majestic electric refrigerator, radio and refrigerator models are being developed in the recently equipped Grunow laboratory.

A Grunow radio will be exhibited at the Chicago radio show in June, according to present plans. Grunow refrigerators will appear on the market as soon as possible.

Before leaving for a vacation on his ranch near Phoenix, Arizona, Grunow spent several weeks seeking a suitable factory for the manufacture of his forthcoming products.

At present Winan is traveling about the country inspecting plants with the same purpose in view. Sales Manager Young is at work lining up jobbers, and expects to complete his appointments in May.

Grunow, who is said to have $1,000,000 in cash on deposit in Chicago banks, together with the income from a $5,000,000 trust fund, and 40,000 shares of Grigsby-Grunow and Majestic stock, plans to finance the operations. His associates in the Grunow Group are also contributing money and services.

Herbert Richter, who has been connected with the export departments of both the Westinghouse Electric & Mfg. Co. and the Grigsby-Grunow Co., is expected to join the Grunow Group as soon as he is released from St. Luke's Hospital. He will have charge of exports.

ZIMMERMAN CLAIMS HIGH SALES FIGURE

(*Concluded from Page 1, Column 5*)

have witnessed a progressive growth since our entry into the field.

"In 1927, according to our figures, our sales were 6.8% of the industry total. In 1928 that figure rose to 28%, and in 1929 we made 39% of the sales. Last year 40% of all electric refrigerators sold were General Electrics. We expect to duplicate that figure in 1931."

Following Mr. Zimmerman came Chris Steenstrup and his corps of engineers from Schenectady. In a little skit, "Every Wednesday at the Factories," Steenstrup challenged the salesmen to sell more water coolers than he and his men could make, and announced that the design of the G. E. refrigerating machine was substantially unchanged after three years of service.

Appearing in the skit, in addition to Steenstrup, were A. R. Stevenson, Jr., P. C. Morganthaler, W. L. Merrill, J. L. Knight, Clark Orr, Del Newman, J. J. Walker, R. Steck, H. A. Whitesel, F. H. Faust, R. F. Roider, A. M. Sweeney, E. R. Fitzgerald, M. Holz, A. J. Seibt, A. J. Redpath, H. J. Gerlach, W. Ramsey, A. C. Way, W. B. Hill, H. O. Synwoldt, P. Schlansker, L. Nielsen, and W. C. Noll.

A. M. Sweeney, production manager, introduced a new 8 cu. ft. model—a de luxe affair bearing all the feasible trimmings and accessories that had been suggested by members of the organization during the year just past.

Daily Puts On Show

Came then active, dynamic Walter J. Daily, advertising and sales manager, riding across the stage in an Austin roadster. A moving canvas background represented the scenery he was supposed to be passing in his half-pint auto.

At regular intervals signboards appeared in this scenery, on which were the poster advertisements General Electric will run during 1931.

Other visual displays were introduced during the course of Daily's talk outlining the G. E. advertising program for 1931, among which were a peanut vender (singing the popular song of that name to illustrate "rhythm"), a gigantic job press with a real wheel revolving, and a shower of advertisement proofs dropped from traps in the ceiling of the theatre.

"We maintained our 1930 advertising program, which had been planned and approved before the crash of the stock market, throughout the year," Daily said. "The results showed up, we think, in our big sales volume."

"Toppers" Parade

At noon the "Toppers," wearing top hats embellished to look like the G. E. "monitor top," paraded down Cleveland streets from the Little Theatre of the Auditorium to the Cleveland Hotel, where they had lunch.

They were preceded by a band, a mounted police squadron, and four white motorcycles with refrigerator replicas as side-cars.

The Thursday afternoon program was opened with a two act sketch, "Bye-Bye or Buy" presented by M. J. Young and A. L. Scaife.

The latter made an excellent sales presentation during the skit, combining knowledge of his subject with tact and a pleasing manner to draw rounds of applause.

W. H. Crawford, vice president of the General Contract Purchase Corp., outlined the new G. E. time-payment policy, by which the 1931 General Electric refrigerators may be purchased for $10 down and $10 a month.

Following Crawford's talk F. M. Corliss, taking four successive parts, and J. De Jen tried their selling arts on Rosabelle Rogers in another little skit, "Security de Luxe." A voice issuing from a loud speaker did the talking for all the characters.

Edwina Nolan Talks

"Every user brings a friend," Edwina Nolan, home service director, told the group. "Accessories comprise the most important parts of a woman's life, and you will do well to create good will by following up sales with accessory gifts.

"Women like change. Tell your prospects how they can make new dishes, do new culinary tricks, with an electric refrigerator. Women aren't interested in engineering specifications — they're interested in food."

Shakespeare might have snorted in his grave had he heard the title of the three-act playlet, "The Training of the Shrewd," which followed the charming Miss Nolan on the stage of the Little Theatre, but he also might have sat up and taken notice had he seen the brand of acting produced.

A. R. Green, Paul H. Dow, Earl H. Norling, L. P. Aurbach, Julia Grosscup, Ursula O'Donnell, Laura Thompson, B. F. Slye (who played the part of "Skinem"—what's in a name?), and C. A. Turner demonstrated in this neat dramatic turn how the enthusiasm of youth could convert a confirmed old hardware storekeeper into a modern electric refrigerator dealer.

All the members of the cast were selected from the home office force, and proved to be a dandy group of amateur Thespians.

Speaking on the subject, "Cities, Towns and Crossroads," A. A. Uhalt pointed out the great field for dealerships in the hamlets and villages of the nation, where representation is sparse indeed.

Uhalt introduced Alfred L. Hart, a Rex Cole dealer in Suffolk county, Long Island, New York. Hart told how he had established 38 sub-dealers in one week, and how he covered two counties thoroughly.

"I'd rather be an electric refrigeration dealer under Rex Cole than anything else in the world," Hart testified.

The Big Parade

G. E. 'Toppers' Parade Through Cleveland's Business District

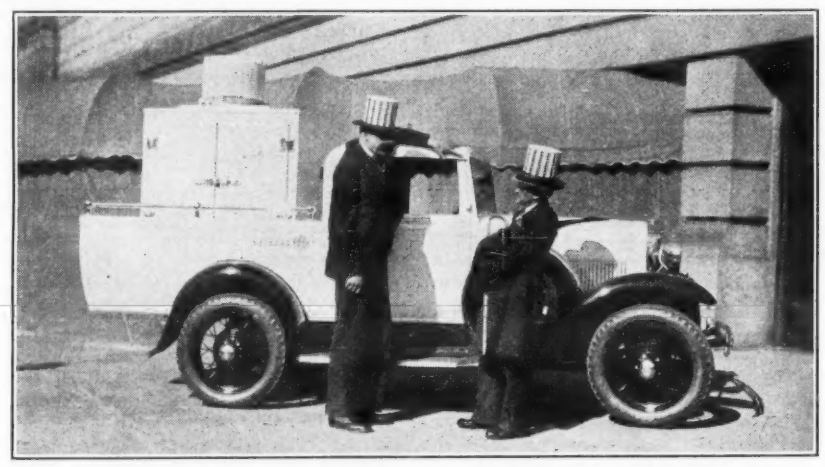
commercial jobs in 1930, and who had turned in $30,000 in orders since January 1, 1931.

Wagner stated that his whole method was built around complete studies of the needs and requirements of his customers. He showed them how to arrange their stores more efficiently, and was very careful with his estimates, he said.

In the evening there was a banquet "as *was* a banquet." Guests were seated at terraced tables, while a jammed balcony received the overflow.

Composed entirely of Cleveland talent, a song-and-dance show was put on which had everything from a truly sweet soprano and a rhythmic band to an eye-opening chorus which looked like it had been picked and dressed (?) by George White.

The "Cabinet" (top "Toppers") was honored at the opening of the Friday morning session. Seated on the stage, these 100 salesmen heard generous



E. R. Horn (left) and C. D. Sessions, tallest and shortest "Toppers" are pictured with the new Ford special delivery truck for G. E. refrigerators.

Commercial Manager W. E. Landmesser concluded the Thursday afternoon program by telling the group that the goal of his department for 1931 was a sales mark of one dollar per capita in every city where G. E. commercial refrigerators are sold.

After presenting the G. E. selective selling plan and telling about the traveling displays of commercial refrigerators maintained by the Pennsylvania Power & Light Co., Landmesser introduced Dick Wagner of the Indiana Service Co., who sold $58,000 worth of

praise from A. C. Mayer, merchandising manager.

The Alpha and the Omega of the General Electric refrigeration department shook hands at the close of this scene, when C. Steenstrup, designer of the unit and head of the engineering department, presented a cup to Albert Matsinger of the Judson C. Burns organization in Philadelphia.

Matsinger, the top "Topper," sold more than $104,500,000 worth of household refrigerators in 1930, it was announced. Similar cups and certificates were received by the remaining members of the "Cabinet."

"When you buy an electric refrigerator it is just like wiring your house for electricity," said J. J. Donovan, apartment house manager, in the next talk. "The purchaser is getting a service, not a commodity.

"Residential construction was less in 1930 than in any year since 1922. Speculative building seems on the increase now, however, and I feel safe in predicting an increase of 25% in construction over 1930 this year.

"Replacements are becoming more and more important. Some distributors found replacements were totaling half of their total business last year; and we find that replacements comprised 20.6% of all apartment house business done by the entire national organization in 1930."

Allison Lauds Advertising

G. W. Allison, refrigeration manager of the N. E. L. A., told his audience that his organization was backing the industry to sell five per cent of the nation's wired homes in 1931.

This could be effected by intensive personal selling and intensive advertising, he pointed out. Advertisers of electric refrigeration were spending 90 cents per domestic meter for advertising and sales promotion, he said.

"Can any of you conjure up a mental picture of President Polk?" he asked. "I'll wager none of you can. But everybody knows the face of Lincoln. That's because the great Emancipator is pictured and mentioned so often in the country's press. Continuous advertising has marvelous power."

Gibbons, Quinn Speak

Floyd Gibbons, famous war correspondent and radio personality, bounced out upon the stage next and told the assemblage that he felt himself to be a full-fledged G. E. salesman because of his rapid-fire radio talks on the G. E. hour.

Gibbons introduced his instructor in things technical, Larry Hawkins, who averred that the General Electric research laboratories, by constantly working on new developments and devices, were providing "leadership insurance" for the organization.

After a brief introduction by Zimmerman, T. K. Quinn, vice president of the General Electric Co. and former manager of the refrigeration department, closed the Friday morning session with a dramatic talk entitled, simply, "Summary." It is reported in full on page 10 of this issue, in "The Expansion Valve."

Divisonal Conferences

Luncheon was followed by a series of divisional conferences in the afternoon. These were:

1. Apartment house, J. J. Donovan, Chairman. Invited: Apartment Managers, Salesmen and Toppers.
2. Commercial, W. E. Landmesser, Chairman. Invited: Commercial Managers, Salesmen and Toppers.
3. Dealer, A. A. Uhalt, Chairman. Invited: Dealers and Wholesale Managers and Dealer Supervisors.
4. Sales promotion, W. J. Daily, Chairman. Invited: Sales Promotion Managers.
5. Toppers and retail sales managers' club, A. C. Mayer, Chairman.
6. Central station, H. H. Bosworth, Chairman. Invited: Central Station Representatives. On this program were W. R. Putnam, Electric Bond & Share Co.; Frank E. Watts, Bennett-Watts-Haywood Co.; H. H. Courtright, Valley Electrical Supply Co., and George W. Allison, Refrigeration Manager, National Electric Light Association.

The following members of the G. E. Topper's club were declared to be members of the "Cabinet" (leading G. E. salesmen in the United States) and

(*Concluded on Page 4, Column 1*)

BOHN PIONEERED THE PORCELAIN REFRIGERATOR

This is but one of the many advances pioneered by the BOHN engineers during thirty-five years of quality manufacturing.

BOHN has built thousands of cabinets for manufacturers of refrigerating machines who desired the utmost in beautiful and scientific construction to best set forth their mechanism.

BOHN would be glad to figure with those organizations who recognize that a quality all-porcelain refrigerator is a distinct merchandising asset.

BOHN REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

Write for details of low prices now prevailing on stock models.

Left to right in the above picture are E. S. Allen, C. D. Sessions, Frank H. Montgomery, F. Robbins, L. S. Sherman, Albert Matsinger, R. G. Schiele, L. K. Dunham, H. G. Bancroft, and G. P. Robinson—all G. E. Toppers. They are tall, short, heavy, thin, young and old, again demonstrating that all types of men can make good money selling electric refrigeration. Messrs. Robbins, Sherman, Bancroft, and Robinson are members of the "Million Dollar Quartette," which sold more than $1,000,000 of apartment house jobs in 1931 for Rex Cole.

15 years of research
3 years in the home

NOW *a* 3 YEAR GUARANTEE *and* LOWER PRICES

YOU KNOW the unparalleled General Electric record—three years of expense-free operation in homes, made possible by fifteen years of General Electric research. You know the prestige of the General Electric name. You know the sales power of the distinctive Monitor Top.

And now at the height of General Electric success comes the added leverage of an unsurpassed 3-Year Guarantee, together with price reductions and terms that begin as low as $10 down.

Thousands will be finally convinced by this 3-Year Guarantee, that General Electric is the wisest buy. Thousands whose first choice has always been General Electric can buy now, due to low terms and reduced prices.

Now both the purchase and ownership of a General Electric Refrigerator bring irresistible new economies. There is real, immediate, definite urge to buy in these attractive price reductions and lowest terms, combined with a 3-Year Guarantee, backed by General Electric!

And your sales *stay sold.* Your profit stays in the bank. Good will piles up for you. Freedom from upkeep cost—guaranteed to every new owner—means freedom from grief and risk for General Electric dealers!

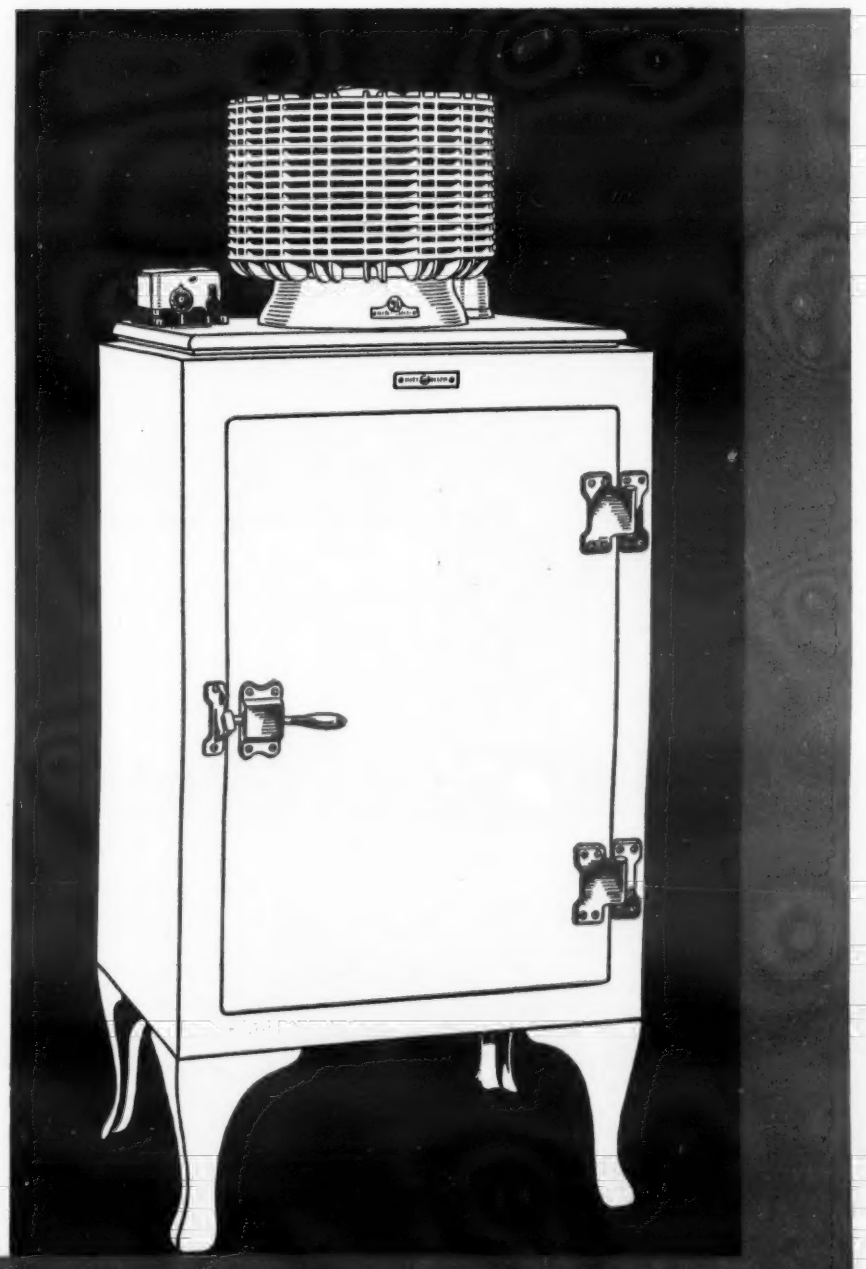
HELPING SALES TODAY

Fifty-two Monitor Top Conventions, now in progress, are helping General Electric selling organizations to cash in on all General Electric advantages, advertising and other sales helps for 1931.

General Electric Company, Electric Refrigeration Department, Section DF 3, Hanna Building, 1400 Euclid Avenue, Cleveland, Ohio.

Join us in the General Electric Program, broadcast every Saturday evening, on a nation-wide N. B. C. network.

INVEST IN AN ELECTRIC REFRIGERATOR



GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

DOMESTIC, APARTMENT HOUSE, AND COMMERCIAL REFRIGERATORS ELECTRIC WATER COOLERS AND ICE CUBE COOLERS

'Toppers' Receive Free Trips to G. E. Convention

(Concluded from Page 2, Column 5)

given expenses-paid trips to the fourth annual G. E. convention.

Albert R. Matsinger of the Judson C. Burns, Inc., Philadelphia, organization, again tops the list with domestic sales running over $104,000. In the commercial division William Aronstein, of Rex Cole, Inc., New York City, led the field with more than $200,000 in sales.

Four apartment house men, all of Rex Cole, Inc., sold a total of $1,000,000 worth of refrigerators. These men are I. S. Sherman, G. P. Robinson, H. G. Bancroft and C. J. Robbins.

Names followed by one star are Cabinet members for the second time, and those with two stars affixed were the recipients of their third trip to the convention. The names follow:

Albert R. Matsinger,** Philadelphia; Bedford F. Taylor, Midland, Tex.; Victor Backstrom, St. Albans, L. I.; G. C. DeLeon,* Pleasantville, N. Y.; Edmund S. Allen,* Camden, N. J.; Ed. L. Glancy,* Los Angeles, Cal.; J. P. Gluck,* New Rochelle; Frank Siegmund,* Richmond Hill; Andrew Zoltac,* Forest Hill, L. I.; H. Norma Middleton, Camden, N. J.; Manuel Reina, Astoria, L. I.; Alan Taylor, Schenectady.

Herbert G. McAdoo,* Kew Gardens, L. I.; J. L. Maurache, Albany, N. Y.; E. E. Noell, Chicago; J. Frank Vernon, Jr.,** Sea Cliff, L. I.; F. H. Montgomery,* Bronx, N. Y.; Ralph Gihon,* Flushing, N. Y.; Robt. Cresse, Allentown, N. Y.; R. H. Short, Allentown, N. Y.; J. J. Delaney,* Richmond Hill, L. I.; Philip McCarron, Port Washington; A. S. Vincent,* Los Angeles.

J. Frank Burke, Philadelphia; Frank Deeley,* Lynbrook, L. I.; Louis W. Ellin, Brooklyn, N. Y.; J. C. Connors, Flushing, L. I.; S. R. Kaar,* Chicago, Ill.; E. B. Wheeler, Peekskill, N. Y.; L. A. Burns, Dallas, Tex.; C. E. Sherwood,* Los Angeles; J. K. Krumholz, White Plains, N. Y.; A. J. Kelly, Paterson, N. J.; L. H. Blank, Los Angeles; Geo. W. Watson, Philadelphia.

Anthony Doherty,* Somerville, Mass.; Daniel Williams, Bellaire, N. Y.; J. C. Laird, Dallas, Tex.; H. L. Pinkerton, Albuquerque, N. M.; Fred J. Faulkner,* Glen Cove, N. Y.; D. MacGillivary, Chicago, Ill.; L. K. Dunham, Jr., Dorchester, Mass.; Geo. C. Hopperton,* Lakewood, O.; Thomas L. Barber, Atlanta, Ga.; George Hamp, New Rochelle, N. Y.; Wm. C. Talley, Richmond Hill; G. D. Force, Westfield, N. J.; D. W. Cooper, W. Palm Beach.

S. W. Doty, Chicago, Ill.; E. J. Sorensen, Madison, Wis.; R. G. Schiele, Schenectady; F. C. Newman, New York, N. Y.; F. R. Horn, Des Moines, Ia.; L. D. DeCourcy,* Bakersfield, Cal.; Arthur D. Anderson, Chester, Pa.; L. Whitestone, Bronx, N. Y.; W. V. Caveney, Richmond, L. I.; W. S. Wells,* Wellesley, Mass.; M. B. Keliehor,* New Rochelle, N. Y.; A. B. Richter, New York, N. Y.

Thomas L. Wilson,* Staten Is., N. Y.; C. T. Spott, Los Angeles; A. J. Doherty, Chicago, Ill.; Howard G. Paul, Jamaica, L. I.; G. W. Zurchor, Hartford, Conn.; W. A. Biel, Chicago, Ill.; Thomas Brady, Brooklyn, N. Y.; V. W. Thompson, Springfield, O.; A. W. Noon, Taft, Calif.; Wm. W. Bartlett, Jamaica, L. I.

L. S. Mayeaux,** New Orleans; Turner Bothel, Richmond*; James S. Mahony*, San Francisco; R. E. Tierney, San Diego; W. D. Horn, Tulsa, Okla.; G. B. Maloney, Claremont, Conn.; Wm. H. Myers,* Pittsburgh, Pa.; John R. Moylan, Atlantic City; Samuel Lessing, Baltimore, Md.; Mrs. Jennie Payne,* New London, Conn.; E. M. Wochenske,* Green Bay, Wis.; S. H. Hight, San Antonio; Norman G. Long, Eau Claire, Wis.

Geo. S. Cochran,* Louisville, Ky.; C. A. Van Dine, El Dorado, Ark.; V. B. Mason, Houston, Tex.; C. B. Scatterday, Akron, Ohio; Walter W. Johnson, Jackson, Miss.; Glen H. Connelly,* Billings, Mont.; Ed. Jorgensen, Omaha, Nebr.; Guy S. Finley, Gadsden, Ala.; Frank C. Oakes, Montgomery, W. Va.; G. E. Sherman, Rock Island, Ill.; L. C. Waring, Jr., Charleston, S. C.; F. C. Milliken, Portland, Me.

W. M. Wilcox, Jr., Charlotte, N. C.; Harry C. Phillips,* Buffalo, N. Y.; B. Hines, Marion, Ind.; P. H. Maloy,* Norwood, Ohio; C. S. Foreman, Dayton, Ohio; Chas. D. Sessions, Provo, Utah; L. H. McGuire, Harrisburg, Pa.; Ben. L. Bristol, Battle Creek, Mich.; J. M. Long, Quintec, Kan.; Raymond Johnson; J. M. Dubrou,* Grand Rapids; J. D. Faber, Minneapolis; Wm. R. Hynes, Rochester; J. B. Noyes, Wheeling, W. Va.; C. D. Briney, Memphis, Tenn.

William Aronstein, New York, N. Y.; S. A. Larsson, Flushing, L. I; W. E. Davis, New York, N. Y.; J. L. Mahony, Montclair, N. J.; Dick Wagner,* Ft. Wayne, Ind.; J. I. Buchanan,* Seattle, Wash.; A. M. Prall, Staten Is., N. Y.; Geo. J. McBride, Cleveland, O.; J. Leipziger, New York; H. G. Frazier, Kansas City; Chas. C. Costello, Malden, Mass.; A. E. Bruce, Wester Groves, Md.

Wayne C. Sharp, Hollywood, Cal.; H. C. Victor, New York, N. Y.; I. G. Bogan, New Work, N. Y.; I. S. Sherman, Brooklyn, N. Y.; G. P. Robinson,'* Morristown, N J.; H. G. Bancroft, New York, N. Y.; C. J. Robbins, Bronx, N. Y.; Geo. W. Cabell, Washington, D. C.; A. H. Hayward, Boston, Mass.; R. R. Lowell, Chicago, Ill.; A. S. Kosser, Cleveland, O.; H. C. Blinsinger, Yeadon, Pa.; Vernon Daniels, Brooklyn, N. Y.; E. P. Lull, New York, N. Y.; T. E. Smith, Chicago, Ill.; Harry Rosenberg, Bronx, N. Y.; E. C. Herbert, New York; W. E. Lionheart,* Chicago, Ill.

State Retail Sales Tax Criticized

Seattle, Wash.—The tax proposed for retail sales in the state of Washington has been made the target of criticism by the electric refrigerator sales executives in this city.

The present bill before the state legislature at Olympia, Wash., proposes to levy a tax of one per cent on the gross sales of electric refrigeration equipment, along with other merchandise sold in the state.

Gordon Prentice, head of Gordon-Prentice, Inc., distributor of General Electric refrigerators in Seattle, stated that the state sales tax would impose a penalty on the state and upon the transaction of business within its confines.

In pointing out how this tax would affect his own business, he stated that instead of a concern such as his doing its distributing from within the state, it would be compelled to move its distribution headquarters to a nearby state which would not impose such a tax.

Other Seattle refrigeration men believe that such a sales tax would be a prohibitive burden, that would be forced on the retailer, and imposed on the public, increasing taxation at a time when living costs must be driven down.

COPELAND CONTINUES TO GAIN OVER 1930 SALES

Mt. Clemens, Mich.—Shipments of Copeland electric refrigerators which showed a gain in January over the same period a year ago, continued their gains in the month of February, according to Louis Ruthenburg, president of Copeland Products, Inc.

"Unit shipments for the month of February were 31.03 per cent above unit shipments for the corresponding month in 1930," Mr. Ruthenburg said. "At the close of February business, unfilled orders were 42.6 per cent above unfilled orders for the same period of 1930.

YORK MAKES YEARLY FINANCIAL REPORT

York, Pa.—York Ice Machinery Corp., reports a net income of $1,276,527 for its fiscal year ending September 30, 1930, as compared with $1,696,184 in the previous fiscal year.

W. S. Shipley, president, told stockholders at the annual meeting that orders entered for the year were 2.2 per cent less than the previous year.

"Unfilled orders carried over at the close of this last fiscal year exceeded by almost 40 per cent the orders on the books at that corresponding period in the previous year," he said. "This, therefore, accounts for the decrease in profits, since all of the earnings were not shown in the statement."

NORGE SHOWS NEW 1931 MODELS AT CONFERENCE

St. Louis—Nearly 200 dealers who are selling electric refrigerators for the Norge Corp. of Missouri, including branches in Kansas, Oklahoma and southern Illinois gathered at the Melbourne hotel, March 4, for their three-day annual sales conference.

Howard E. Blood, president of the Norge Corp. of Detroit, was the principal speaker at the conference. John H. Knapp, a vice-president of the Norge Corp., Detroit, also spoke.

The dealers were given advance sales information on the new Norge line including the low priced models, and two new water coolers.

Advertising plans for the coming year were discussed by R. E. Caldwell, representative of the Cramer-Krasselt Advertising Co. of Milwaukee.

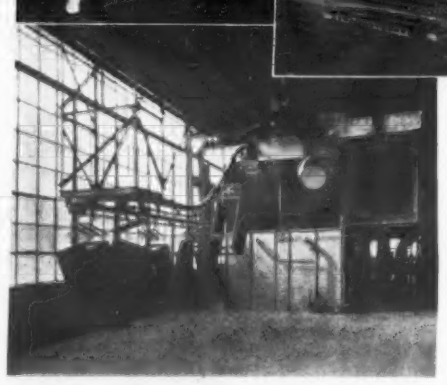
Arrangements for the conference were under the direction of officers of the St. Louis branch of the Norge Corp. of Missouri.

SERVEL Cabinets are Protected by BONDERIZING

With other Advanced Construction Features, the New, Simplified Hermetics have this Added Quality

The hermetically sealed mechanism of these one-a-minute Servels incorporates advanced engineering principles making for simplicity and ability to give long "care-free refrigeration" service.

From the huge 29-acre Servel plant at Evansville, Ind., comes a Bonderized refrigerator every 60 seconds of the working day!



SERVEL cabinets, designed in harmony with modern kitchen furniture styles, fully match the excellence of mechanism . . with *Bonderized* exteriors.

Bonderized! . . . that gleaming, snow-white finish is on to stay. It is a decided sales advantage for the Servel dealer when he can assure the buyer that her refrigerator will be just as attractive after years of service as it is the day it leaves his store. The enamel won't chip off, nor blister. If accidental abrasions occur, rust cannot spread under the enamel causing it to peel. Corrosion—blemishing and destructive—is defeated!

Before the pyroxylin finish is applied to Servel cabinets, they are given a 10-minute dip in Bonderite solution and a quick water rinse. They emerge with their metal surfaces changed to a phosphate which is *chemically clean*, perfectly uniform and slightly absorbent. Enamel clings upon application and is securely anchored upon drying.

The process is adaptable to either mass or small production; it is suited to overhead conveyor line (as illustrated above by photographs taken in the Servel plant) or stationary dip-tank installation, and it requires no skilled labor. Bonderite powder, which is added to boiling water in making the Bonderite solution, is low in cost and conveniently handled.

In the refrigeration, as in the automotive, electrical, radio, building, metal furniture and other industries, leading manufacturers are adopting Bonderizing because it is an improved metal finishing method and makes the product more salable.

We are glad to supply complete information regarding the process and its application to any particular requirements.

Write today for a copy of the descriptive book — "Bonderite."

Bonderite — HOLDS PAINT TO STEEL

PARKER RUST-PROOF COMPANY
2197 East Milwaukee Avenue Detroit, Michigan

Joint Merchandising Committee Will Conduct Extensive Survey

(Concluded from Page 1, Column 2)

sented in the conference in the promotion and sale of these appliances.

(b) To determine the practices and areas of their application, now followed in merchandising of electric appliances which are causes of misunderstanding.

(c) To endeavor to bring about full understanding of their respective viewpoints between those interested in merchandising of electrical appliances, to the end that the business interests of each may be properly promoted, but always predicated on recognition that the public interest is paramount.

(d) To study those policies and methods in electrical merchandising which have proven most sound and successful; and to make suggestions for improvements in facilities to the public, and for stimulation of household uses of electricity generally.

There is at present a lack of uniformity in merchandising practices or methods among utility companies and others engaged in this business, the committee believes. The survey looks entirely to a factual ascertainment of conditions.

It is not contemplated that uniformity will result from this survey, nor by assisting it does any company obligate itself in any way as to its practices or procedures in the future, committee members point out.

It was agreed that the survey could be better conducted if a man were employed to devote his entire time to the work, and selection has been made of G. H. Paine. Mr. Paine has been on the staff of the United States Chamber of Commerce as assistant director of the Domestic Distribution Department.

The assistance of member companies of the National Electric Light Association to Mr. Paine in his work has been requested.

Subjects connected with the merchandising of gas appliances will not be covered by this joint committee. It was suggested in the conference, however, that the National Retail Dry Goods Association confer with the American Gas Association, looking toward a joint conference between them on subjects related to gas appliance merchandising.

The committee, members point out, is not inclusive of all parties interested in electrical merchandising, such as contractor-dealers, electric manufacturers, drug trades. The furniture and hardware viewpoint is expressed through informal representation. It is expected that the survey, however, will give attention to all aspects, with consideration of amplifications in committee personnel reserved for the future.

Mr. Owens, in behalf of the National Electric Light Association, presented certain viewpoints to the conference on the utility companies' relation to merchandising and promotion of electrical appliances.

The conference came to agreement on the following general ideas:

That question is not raised at this time of the right of a public utility company to engage in merchandising of electrical appliances.

That it is recognized that electric utility companies have a definite responsibility to the public in developing, promoting and making known electric appliances, the utilization of which will add to the comfort, convenience and profit of the consumer.

That although it is recognized that there exists in certain local territories differences of opinion on merchandising practices, these relations can be worked out in an entirely satisfactory manner by surveys to determine facts and conferences between the parties interested.

That although the National Committee can and will render much assistance, the accomplishment of the main objectives depends primarily for its success upon the efforts of those in the local communities.

It is therefore strongly recommended that in as many local communities as possible throughout the United States, the business groups represented in this conference be encouraged to confer with each other for a frank interchange of viewpoints and with the thought in mind of bringing about merchandising relations mutually satisfactory and in the public's best interest.

It is the view that this problem is one essentially of understanding and co-operation between business men approaching the question from the standpoint of public interest.

The members of this Joint Committee are as follows:

National Retail Dry Goods Association

D. F. Kelly, president, National Retail Dry Goods Association; president, The Fair, Chicago, Ill. R. J. Atkinson, past president, National Retail Hardware Association, Brooklyn, N. Y. Harry F. Cappel, past president, National Retail Furniture Association; Cappel Furniture Co., Dayton, Ohio.

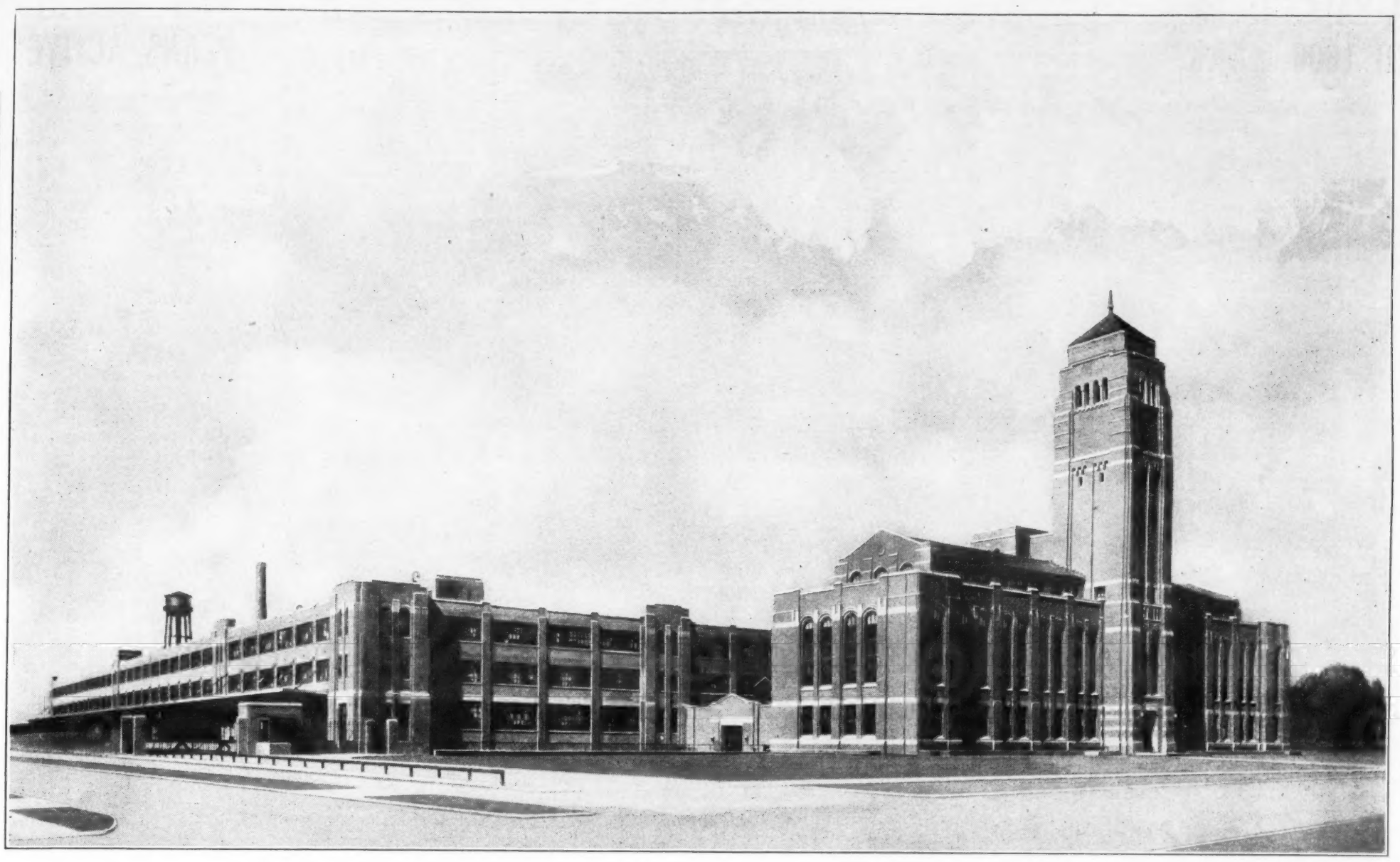
A. Lincoln Filene, Wm. Filene's Son Co., Boston, Mass. Lew Hahn, president, Hahn Department Stores, Inc., New York City. Alfred B. Koch, president, La Salle & Koch Co., Toledo, Ohio.

National Electric Light Association

J. F. Owens, vice-president N. E. L. A., vice-president and general manager, Oklahoma Gas & Electric Co., Oklahoma City, Okla. Charles L. Edgar, president, Edison Electric Illuminating Co., Boston, Mass. John F. Gilchrist, president, Commonwealth Edison Co., Chicago Ill.

C. E. Groesbeck, president, Electric Bond & Share Co., New York City. Marshall E. Sampsell, president, Central Illinois Public Service Co., Chicago, Ill. M. S. Sloan, president, The New York Edison Co., New York City.

The chairman of the joint committee, as a whole, is D. F. Kelly.



Largest in the world!

SEVENTEEN years ago Kelvinator introduced the first successful domestic electric refrigerator. To-day, Kelvinator is the largest exclusive manufacturer of electric refrigeration equipment in the world.

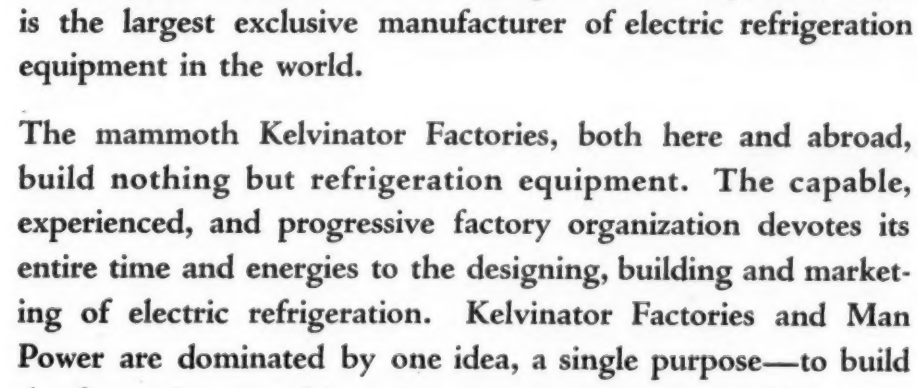
The mammoth Kelvinator Factories, both here and abroad, build nothing but refrigeration equipment. The capable, experienced, and progressive factory organization devotes its entire time and energies to the designing, building and marketing of electric refrigeration. Kelvinator Factories and Man Power are dominated by one idea, a single purpose—to build the finest electric refrigeration equipment in the world.

This singleness of purpose means much to a Kelvinator Dealer. It assures him the finest, most salable merchandise. It guarantees him policies that are eminently fair, liberal, and entirely satisfactory. It insures him a relationship that is mutually profitable, permanent, and highly desirable.

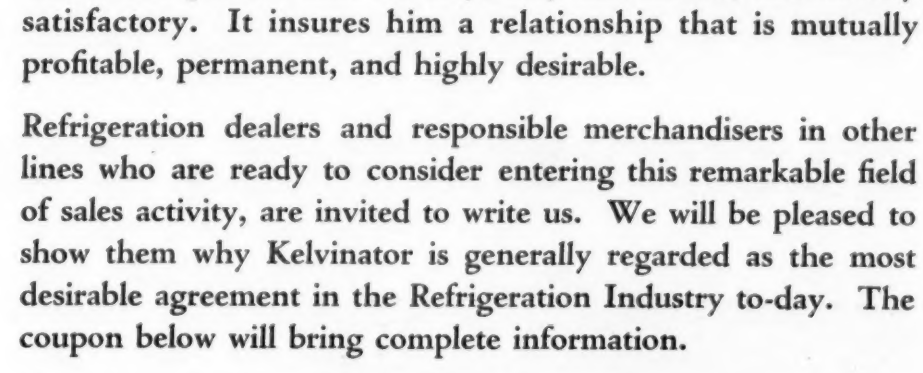
Refrigeration dealers and responsible merchandisers in other lines who are ready to consider entering this remarkable field of sales activity, are invited to write us. We will be pleased to show them why Kelvinator is generally regarded as the most desirable agreement in the Refrigeration Industry to-day. The coupon below will bring complete information.

Kelvinator Corporation, 14245 Plymouth Road, Detroit, Mich.
Kelvinator of Canada, Limited, London, Ontario
Kelvinator Limited, London, England

Kelvinator



The illustration above shows the Kelvinator Cabinet factory and the largest porcelain plant in the Industry, located at Grand Rapids, Michigan. The Detroit Factory and Administration Building is shown at the top of the page.



The Kelvinator factory at London, Ontario, is shown above. A factory of approximately the same size is located at London, England. Kelvinator factories represent an investment of more than $10,000,000 in plants and equipment.

(247)

COUPON

KELVINATOR CORPORATION
14245 Plymouth Road, Detroit, Michigan
Gentlemen: Please send information regarding the Kelvinator Agreement.

Name _____

Street Address _____

City _____ State _____

OMAHA SALES IN '30 TOPPED 1800 MARK

By Charles P. Rodman

ESTIMATED sales of electric refrigerators by dealers, distributors and central stations in the Omaha territory during 1930 total 1,823 domestic and commercial units, as compared with 2,097 sales for the previous year.

Domestic sales during last year fell off 18 per cent, a decline of 313 machines, as compared to the 1929 period. During 1930, 1,562 machines were placed in Omaha homes, while the domestic sales for the previous year reached a total of 1,875.

Increases in commercial equipment sales were reported, the total for the year amounting to 261 units, a gain of 39 machines or 18 per cent. The combined domestic and commercial sales show a loss of a little better than 13 per cent.

It is estimated that 9,717 domestic and commercial electric refrigerators have been sold in this area during the last six years. Of this total, 8,671 are domestic units and 1,046 commercial units. The six-year sales figures are as follows:

Year	Number Domestic	Number Commercial	Total
1925	512	....	512
1926	1,176	....	1,176
1927	2,048	310	2,358
1928	1,498	253	1,751
1929	1,875	222	2,097
1930	1,562	261	1,823
Total	8,671	1,046	9,717

There are approximately 52,000 electric meters in Omaha. Taking the total number of installations of electric refrigerators in the city, 9,717, one finds slightly more than 18 per cent of the homes and business places have electric refrigeration. This percentage on Jan. 1, 1930, was only 14¼%.

In the Omaha field some changes were noticeable. Ice-O-Matic and Majestic were both newcomers.

The Schmoller & Mueller Co. is handling Ice-O-Matic, and G. C. May, in charge of activities here, has placed the machine in all ten of the branch stores of the company.

This company is concentrating on sales in the rural field. Salesmen have trucks upon which are carried pianos, radios and refrigerators. Calls are made on country residents, and if a deal is made, the machine is then unloaded and papers signed. All of Nebraska and the western eleven counties of Iowa have been added to the company's selling territory.

The Nebraska Power Co. recently added General Electric refrigerators to its selling equipment. Previously Kelvinator was the only refrigerator sold by the company.

The Storz Electric Refrigeration Co. continues as General Electric refrigerator distributor for all of Nebraska, a portion of Iowa and Missouri. This company reported a gain in sales over 1929 for both domestic and commercial units.

Electrolux sales for 1930 show that 84 refrigerators were placed in homes in the city. The Metropolitan Utilities Co. sold this number direct from the sales floor, as no outside salesmen were used. This company has just made an appropriation of $17,700 for advertising gas appliances in 1931, and Electrolux will be featured in all advertising for the year. Newspapers and direct mail will be used.

During 1930 several large jobs were installed in Omaha. Three hospitals, two large schools, the county home, and seven apartment houses, from 16 to 20 apartments each, were among the buildings in which electric refrigeration systems were installed.

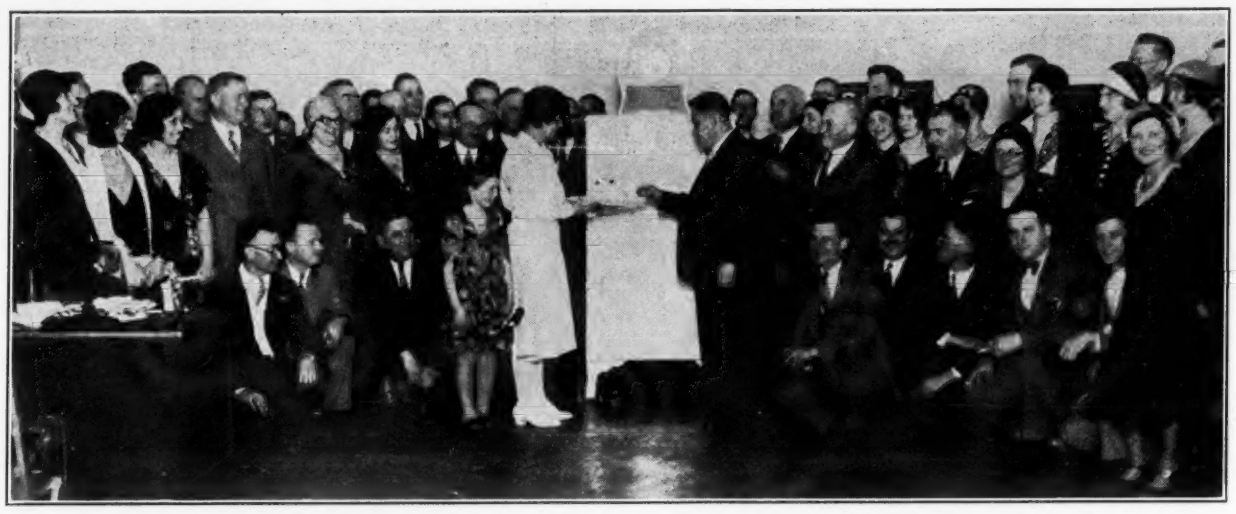
The Rendla Co., handling a complete line of butcher supplies and display cases, reported an increase in business. cases, reported a large increase in business.

The Omaha Fixture & Supply Co. also reported sales gains for 1930. It has extended distribution, and a new display case for quick-chilled meat was placed on the market in 1930.

The one manufacturer of electric refrigerators in Omaha, the IcElect Corp., sold over 150 machines during the last year. Agencies were established in five European countries.

The Baker Ice Machine Co., which celebrated its twenty-fifth anniversary last year, reported that sales were made in every state in the Union and a number of foreign countries. Recently the company sent a carload of machinery to the coast for shipment to the Fiji Islands.

Philadelphia Company Holds Weekly Staff Gatherings



Home Economist Puts on Demonstration at Trilling & Montague Meeting

NEW DISTRIBUTOR PLANS ACTIVE YEAR

Philadelphia—Trilling & Montague, distributors of Zenith radios, have adopted the slogan, "Hot After Cold Business," in connection with their merchandising program of the Norge electric refrigerator.

Pictured on this page is one of the recent weekly gatherings of Norge dealers, salesmen and their wives and sweethearts.

This meeting featured a demonstration by a representative of the Knox Gelatine Co., who spoke on the methods of making frozen desserts in a Norge refrigerator.

David M. Trilling discussed the features of the Norge product and the various models. These meetings are held each Tuesday evening.

Supplementary to the weekly meetings, Trilling & Montague issue a series of sales bulletins which are mailed to Norge dealers and prospective dealers.

During the week of March 2 new Norge models were shown at dealer meetings held in Allentown and Harrisburg. These meetings were also the occasion of the first showing of the new Zenith 10-tube Hypermetron set.

FLORIDA G. E. COMPANY PROMOTES 3 OFFICIALS

St. Petersburg, Fla.—Three promotions in the executive staff were recently made by the Florida Electric Refrigeration Co., distributor of General Electric refrigerators.

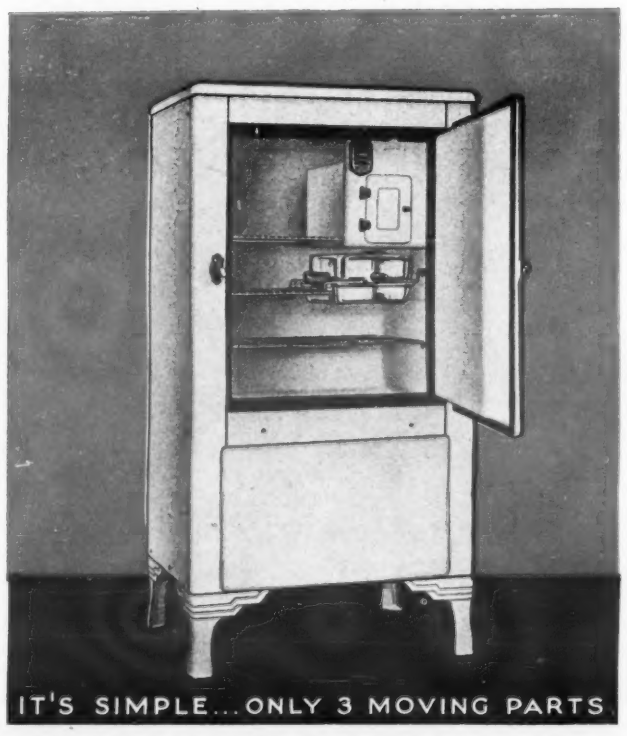
J. H. Bradley has been made vice-president of the company, having been moved up from the position of assistant treasurer and auditor, which he held since joining the staff two years ago.

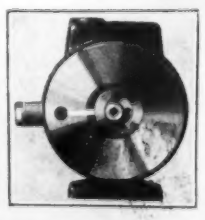
Miss I. F. Patterson has been made secretary and will continue to have charge of sales promotion and advertising.

Succeeding Mr. Bradley as auditor is E. C. Cox, who has been with the company for the last two years.

The NORGE

A SHORT LINE · SERVICE FREE





JUST THREE standard models and two specials make up the Norge line.

Only Norge has the Rollator cold making mechanism .... simple, just a roller revolving in a permanent bath of protective oil .... compact, almost everlasting.

The chassis, the complete refrigerating system, is replaceable, quickly, simply, no tools but a screw driver and wrench being required.

A complete new advertising and merchandising plan is now functioning for Norge .... it is putting across Norge's quality features. (19 of them are original with Norge.)

It is giving Norge Dealers a real backing, drawing people in to "see the Norge" and *selling* the Norge.

The first BIG selling year with Norge after six years of steady, consistent growth, will establish many, many dealers in an enviable position.

The possibilities are inviting. To write now may be to get first complete detailed information in your locality.

NORGE CORPORATION, Division of Borg-Warner
658 EAST WOODBRIDGE ST., DETROIT, MICH.

NORGE WITH ROLLATOR

EVERY AMERICAN MOTOR CAR MADE TODAY CONTAINS MATERIAL MADE BY BORG-WARNER CORPORATION

Doherty Subsidiaries Report Slight Decline In 1930 Refrigeration Sales

New York City—Electric refrigeration sales by the subsidiaries of Henry L. Doherty & Co. fell off 3.92 per cent during 1930, as compared with sales for the previous year, according to Thomas F. Kennedy, manager of the new business department.

Domestic and commercial electric refrigeration sales during 1930 totaled 8,430 units, as compared with 8,774 in 1929, 6,443 in 1928, and 5,783 in 1927.

Gas refrigerator sales by the subsidiaries during 1930 amounted to 625 units, of which 378 were sold by the Gas Service Co. Group.

It is estimated that the value of the electric refrigeration equipment sold in 1930 by the member companies will approximate $1,800,000. The 8,430 units, each using about 600 kilowatt hours, will consume yearly better than 5,000,000 kilowatt hours.

There are approximately 45,000 electric refrigerators connected to the power lines of these subsidiaries, according to officials of the new business department. They estimate that about 27,000,000 kilowatt hours are consumed annually in the operation of these machines.

This year the company has set its quota at the 10,000 mark, and selling efforts will be concentrated towards topping that quota.

Leading the Doherty subsidiaries in refrigeration sales for the year was the Public Service Co. of Colorado, which reported 2,107 installations, a gain of 562 over the previous twelve months. In Denver alone, 1,378 refrigerators were added to the power lines.

J. M. Eakin, manager of the refrigeration division at Denver, stated that sales valued at $291,250 were made in Denver. G. L. Trudo led the commercial department in that city with sales totaling $45,320, while H. Moore topped the domestic salesmen with a total of $22,399. On November 13, during the anniversary sale, the Denver sales skyrocketed to the $7,939 mark.

Sales by the Ohio Public Service Co. decreased slightly, as 2,101 units were reported by C. L. Dunn, new business manager, as compared with 2,413 in 1929. Mr. Dunn reports that refrigeration sales by his company have amounted to 9,683 machines during the last five years.

The Toledo Edison Co. during the last five years sold 10,411 electric refrigerators, of which 1,731 were added to the lines during 1930. The value of the refrigeration equipment installed last year was placed at $571,747. S. F. Lupe, with sales of $38,828, was high man in the commercial refrigeration department. L. E. Valois led the domestic group with sales of $21,577.

The sales of refrigeration machines by the various Doherty properties for 1930 are listed in the next column.

Property	Number Sold
Adrian	117
Bristol	165
Danbury	251
Durham	274
Elizabethton	124
Erwin	36
Greeneville	25
Johnson City	159
Joplin	461
St. Joseph	688
Sedalia	39
Toledo	1,731
Defiance	80
Lake Shore	51
Michigan	21
Ohio Public Service	2,101
Alliance	136
Ashland	139
Elyria	219
Lorain	249
Mansfield	245
Massillon	317
Port Clinton	97
Sandusky	305
Warren	394
Public Service of Colorado	2,107
Alamosa	158
Boulder	104
Brighton	24
Cheyenne	60
Denver	1,378
Fort Collins	70
Grand Junction	152
Idaho Springs	19
Leadville	18
Salida	44
Sterling	80
Total	8,430

Major electric appliance sales by the subsidiaries are listed below. Electric refrigerators ranked third.

Appliances	Number Sold
Fixtures, domestic	16,848
Fixtures, commercial	7,305
Flood lights	786
Portable lamps	4,264
Ranges	2,714
Fireless cookers	835
Hot plates	1,102
Grills	264
Toasters	4,122
Waffle irons	3,753
Percolators	3,950
Electric refrigerators	8,430
Washers	5,634
Ironers	1,923
Water heaters	157
Flat irons	11,811
Fans	2,331
Sweepers	4,832
Sweepers, hand	1,084
Radio sets	4,188
Sewing machines	99
Clocks	1,435
Curling irons	807
Room heaters	1,146
Heating pads	1,559
Health lamps	281

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DRY·ZERO

THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

MERCHANDISING SECTION

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Editorial Aims of the News

To encourage the development of the art.

To promote ethical practices in the business.

To foster friendly relations throughout the industry.

To provide a clearing house for new methods and ideas.

To broadcast the technical, commercial and personal news of the field.

A New Seasonal Curve?

PIONEER dealers in electric refrigeration had three handicaps. In the first place, sales resistance was high, making sales costs abnormal. Second, service costs sometimes absorbed all profits. And third, many dealers lacked sufficient knowledge to keep the machines they sold in good running order.

Dealers have made good—and often large—profits in recent years, however, partly because the three abovementioned handicaps have largely been overcome.

The last few years have witnessed a marked improvement in equipment, with the result that service costs have become nominal and even—in some cases—almost negligible.

Service Costs Lowered

Furthermore, a large number of well-trained service men are now available, and dealers themselves have learned how to service an electric refrigerator, which again has reduced service costs.

Likewise, sales resistance has been worn down by the cumulative effect of the millions of dollars spent in public education over a period of time. Electric refrigeration is now serving more than 3,000,000 American families, and public acceptance has increased greatly in the last few years.

Just as production engineers have learned more in the process of doing their jobs and so have made better machines, and as service men have learned how to take care of them better, so have sales organization learned more about the art of selling electric refrigerators.

And dealers have cashed in on the combined results.

What of the Future?

But what of the future? Will the cumulative effects of better products, better methods, and increased public acceptance again be the means of enabling dealers to do a profitable business in the face of a depression?

An interesting answer presents itself in the possibility that the selling season may be lengthened in 1931, and the sales curve stretched out. The upward swing of the general business cycle may be sufficient to offset the normal fluctuation of the seasonal cycle in refrigeration sales.

A general feeling seems to exist that business is on the upgrade. It is entirely likely, however, that the return to normalcy will be slow.

Fear was engendered in the minds of buyers by the stock market crash and the subsequent slump, and as a result money which normally might have been spent for needs like electric refrigeration went into banks—which have been showing unusually large deposit records during depression months.

Public confidence may return in waves, each larger than the last. And as business begins to pick up, some of this money which has been on deposit in banks may be released in consecutive swells.

Lengthened Selling Season

Last year people were being sold on electric refrigeration, and yet did not buy because of general conditions. The same situation may recur in the early months of 1931. When confidence becomes stronger, however, these already-sold prospects may enter the market in considerable numbers.

Thus the closing date of the refrigeration sales season may be advanced materially. And the dealer who continues his sales campaign beyond the time when he has been accustomed to slacking up may cash in on an upward swing of the business cycle.

Stated briefly, there are indications pointing toward a lengthened selling season for electric refrigeration in 1931, and an entirely revised sales curve for the industry.

GLEANINGS

FROM RECENT PERIODICALS

"Years ago, Thomas R. Marshall rescued his name from the obscurity allotted to most Vice Presidents of the United States by announcing that what this country needs is a good five-cent cigar.

"Not to be outdone, the governor of the Federal Reserve Bank of Atlanta, Eugene R. Black, has put in his claim for immortality by implying that what this country needs is a five-cent standard of living. 'I do not agree,' he has proclaimed recently, 'with those men who are saying that in America there must be no retrogression from the present high grade of living. . . We have been living in an automobile, a Frigidaire, a radio era, and have been sitting in the atmosphere of a Corona-Corona. We cannot pay our debts and continue in that atmosphere. Let us not fool ourselves.'

"But if it is good bankers' economics for us to use fewer automobiles, electric refrigerators, and radios, why not use fewer electric lights and go back to candles? Why not give up billion-dollar banks and go back to little strong boxes? Better still, why not emigrate to China in a body? China's standard of living ought to be low enough to satisfy anybody.

"One of our readers, however, is from Missouri. 'You and Governor Black,' he says, 'flatly contradict each other. What are the facts?'

"In order to find a year which gives any point to the Governor's charge of extravagance, we have to go back to 1919. By 1921, however, both the buying power and the creating power of wage earners was seventeen per cent above the year 1899.

"Since 1921 their creating power has far outrun their buying power. Production has exceeded consumption. In 1923 production was up 38 per cent, but consumption by wage earners was up only 32 per cent. In 1925, production was up 54 per cent, but consumption was up only 30 per cent. From 1926 until the crash in the stock market, production in general continued to increase faster than consumption in general.

"Not until after the stock market crash did the reverse process set in. In other words, it is precisely during these last twelve months of excessive thrift that the country has been extravagant, in the sense of using up wealth faster than it has created it. Saving too much is extravagance. . .

"Again we say, let us not fool ourselves: this country is perfectly able to produce and consume, on a sound economic basis, not only more automobiles and refrigerators and radios than the number which worries the Governor, but also more houses and pianos and vacuum cleaners and washing machines and tractors and all the other products for which now, as always in the past, some citizens are in debt to others.

"Many bankers agree with us. It would be helpful right now if these bankers would carry on 'an intensive campaign,' not to lower living standards, but to raise them.

"During the fifteen years prior to 1928, we did raise our living standards. Prosperity was real. The profits of capital were not mainly paper profits. The profits of labor were scarcely paper profits at all. During this period, as Professor Douglas has shown in his monumental study, the real wages of all workers in all manufacturing concerns went up about 34 per cent.

"In other words, for every three rugs, rings, ruffles—yes, and radios and refrigerators and other 'luxuries'—which wage earners could buy in 1913, they could buy four in 1928. Even so, as we have shown, the country was not living beyond its means, for productivity increased much more rapidly than wages. . .

"How did such prosperity happen? That question brings us to the basic fallacy in the argument of those who, in order to restore prosperity, urge us to cut down our buying of automobiles, radios, and electric refrigerators. For our greatest period of prosperity was precisely the period which saw over ninety per cent of the growth of the automobile, radio, and electric refrigerator industries.

"Was there any connection? There certainly was. For these three industries expanded until, directly and indirectly, they put over six billion dollars a year into pay envelopes.

"Here, again, we must guard against fooling ourselves. If these six billions had not been paid as wages in connection with these new industries, they would not have been paid at all. If we had not made and bought and used the 'luxuries' of which the Governor complains, we should not, in their place, have bought more 'necessities.' We should merely have stayed on a lower plane of living. As a matter of fact, the expansion of bank credit and wages in connection with the expansion of new industries chiefly accounts for our prosperity.

"It is mainly in that way that we have contrived to use instead of waste our savings. We did not buy these 'luxuries' because we prospered. It is more to the point to say that we prospered because we bought these 'luxuries.'"—William Trufant Foster and Waddill Catchings, *Forum*.

Letters from Readers

Refrigerators Break Into Society

St. Paul, Minn.

Editor:

Nothing is more indicative of social influence on mechanical production than the rise of the ice-box in the last fifteen years.

Or, perhaps there is equal warrant for reversing the statement and saying that mechanical progress through the "ice-box," as a medium, has been an influence in society! Be that as it may, electric refrigeration is a decidedly important element today in all departments of American family life.

In 1915, keeping the refrigerator filled with ice was the prime consideration of cold-keeping; today, "it's all in the juice"—a matter of maintaining a cold temperature by control of current.

Before the world war, sixteen cubic feet of storage was typical of the ice-box of the largest homes; now a refrigerator of 70 cubic feet, or nearly five times as large, is common enough to occasion no astonishment.

More than that, refrigeration has run to plurals in the home. The more luxuriously appointed the dwelling, the more places there seem to be in which to build a refrigerator.

In the kitchen proper are the major units for family supply, one or more. In the servants' hall is to be found an only slightly smaller model of similar type.

Meanwhile, there has sprung up the habit of after-theater "refueling," known as the midnight snack, that calls for a smaller model refrigerator, just within the walls of the butler's pantry or in a little cubby outside it, where one may serve oneself or hold an ice-box party for a dozen, without disturbing the family or the family food store.

With an increasingly great number of basement amusement rooms being built, and more particularly when this room is used as the children's playroom, comes the natural need of a refrigerator for that service—this, too, is met with a specific type.

Similarly, the nursery on the upper floor, with its requirements for food for infants and young children, merits its own supply of cold air for food preservation, and gets it in the form of a junior model.

The nimrod of today, with his duck boat deluxe and his cabin car, is hardly content to enjoy less perfect equipment for safe-keeping of game on his return to the home base.

To answer his demand, there has been created a game refrigerator, usually located in the basement or at the grade entrance and employed exclusively for the fruits of the chase.

In the 30-odd Seeger years of real refrigeration history, this instrumentality of health and comfort has developed from a somewhat primitive ice-block holder to an elaborate scientific appliance, flexible in its adaptability, and, where convenience is a greater consideration than cost, used in a series to cover a variety of diverse purposes.

The "great house" of today is fortified fully on food insurance from the short-order unit that is called on to provide sustenance in the wee sma' hours, to the beautiful all porcelain oversize healthful superserver, that occupies a whole wall and would seem adequate storage for the frozen fancies of a regiment.

A. B. Connelly,
Secretary, Greve Advertising Agency, Inc.

Breakdown of 1930 Sales Statistics

Wilmington, Del.

Editor:

In the detailed breakdown of 1930 sales, we would be glad to know what types of machines were intended under the two descriptions:

"Other complete commercial systems (compressor cooling unit and cabinet, cooler or display case).

"Additional cooling units and cabinets, coolers or display cases."

We would assume that the first description would mostly include installations for meat dealers, florists, etc., and that the second description would refer mostly to equipment installed in old ice boxes.

We would be very glad to have this additional advice.

W. J. Humphrey,
Development Department, E. I. DuPont de Nemours & Co.

Answer:

"Other complete commercial systems (compressor, cooling unit and cabinet, cooler or display case) refers to all types of commercial installations other than water coolers and ice cream cabinets. No doubt a large share of these installations were made in meat markets, florist shops, grocery stores, delicatessen, restaurants, etc.

"Additional cooling units and cabinets, coolers or display cases" refers to cooling units installed in old ice boxes, also to cooling units and cabinets where two or more of such cooling units are attached to one compressor. In other words this refers to "multiple installations" of commercial equipment.

Kind Words Department

Detroit.

Editor:

We believe all Copeland overseas distributors are subscribers to the NEWS, and we always make it a point of recommending a subscription to the NEWS to each new distributor, as we regard ELECTRIC REFRIGERATION NEWS as the most important trade paper in the field.

J. C. Mathews,
General Manager, H. M. Robins Co.

Spokane, Wash.

Editor:

We heartily congratulate you upon the splendid progress that you are making and I can assure you as a result of a very recent trip over the entire Pacific Coast area, calling on our dealers, as well as dealers handling other makes of refrigeration equipment, that ELECTRIC REFRIGERATION NEWS is being eagerly read by everyone in the business.

H. L. Masterson,
Electro-Kold Corp.

New York City.

Editor:

The Gross-Brennen Utilities Corp. has recently been appointed distributors in this district for the Norge electric refrigerator.

We, of course, will have all of our dealer contact men subscribe to the ELECTRIC REFRIGERATION NEWS; and the writer personally, has been getting it for the past six or seven years, as I firmly believe it is the most valuable paper in the trade today.

H. A. Castellucci,
Gross-Brennen Utilities Corp.

January 31, 1931.

"Wish to start off with a word of praise for your very high-grade publication, and it goes without saying we would not know how to get along without it."

LEROY MORGAN,
American Refrigerator Car Co.,
Miami, Florida.

'More News About'

I would like to see more news about:

Frigidaire—C. V. Long, Greensburg, Pa.

Electric drinking water cabinets—Puro Filter Corp., Philadelphia, Pa.

General Electric refrigerators—Refrigerator Sales Corp., Washington, Pa.

Frigidaire—E. O. Hunt, Schenectady, N. Y.

"Dry-Kold" installations — The "Dry-Kold" Refrigerator Co., Niles, Mich.

Public utilities — Edgar Needham, Clarksburg, W. Va.

Gibson electric refrigerators—Miss A. H. Taborsky, Bellwood, Ill.

Frigidaire.—Al. A. Herman, Brooklyn, N. Y.

Kelvinator.—Ivan F. Brady, Elmira, N. Y.

Copeland.—W. H. Lyon, Ayers Lyon Corp., Boston, Mass.

Frigidaire, Westinghouse. — Knoeller Electric Co., Green Bay, Wis.

Getting in touch with the interested prospect.—H. V. Monroe, Piqua, Ohio.

Absorption and house cooling.—Earl W. Kaufman, Dayton, Ohio.

On Our Bookshelves

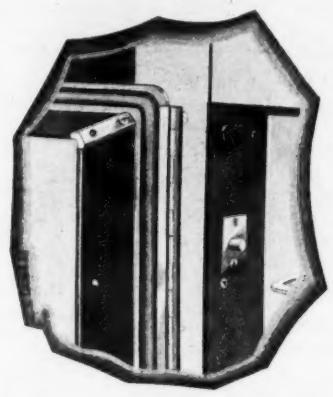
"JOURNEYS WITH REFRIGERATED FOODS." SERIES TWO: FRUITS.

Author: M. E. Pennington. Publisher: Household Refrigeration Bureau of the National Association of Ice Industries, 51 Chambers St., New York City.

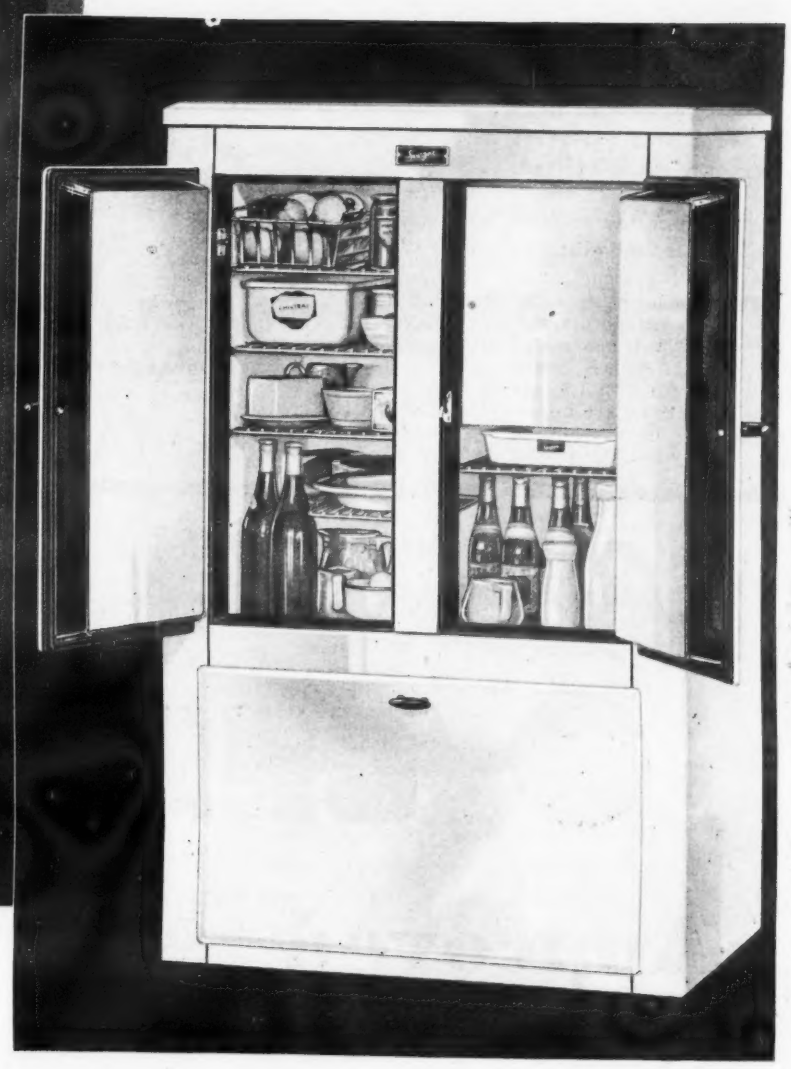
BRIEF accounts of the manner in which the large national fruit markets are supplied are interestingly presented in this new pamphlet, written by the director of the Household Refrigeration Bureau.

Georgia peaches, which appear in our markets in June, fully two months before the northern orchards are ripening, are discussed in an early page of the bulletin. Refrigerated cars of 20,000 pounds capacity play an important role in distributing these early fruits to domestic markets all over the country.

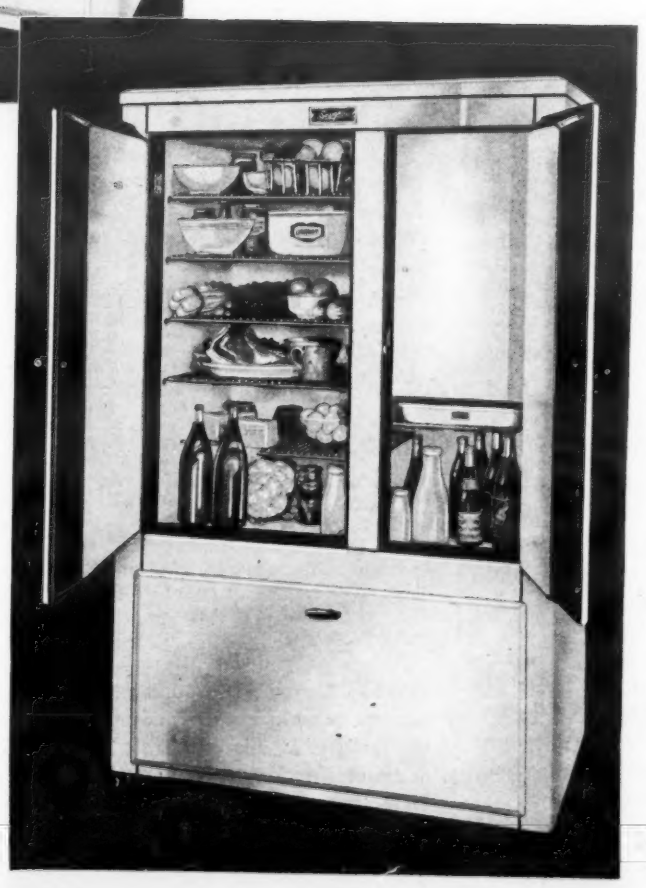
This refrigeration of fruit in transit is what happens to part of the 65,000,000 tons of ice used in this country each year, the writer concludes.



Seeger Continuous Hinge and Door Construction



CABINETS BY Seeger SAINT PAUL



All DeLuxe Cabinets by Seeger are equipped with Electric Light, Chiltray, Vegetable Chiltray and Fruitray. Water Tank and Vegetable Bin at slight additional cost.

All Cabinets by Seeger are fitted to receive legs that can be had in four sizes, 4", 6", 8" and 11" high.

Modern beauty of line is shown to the best advantage in the new DeLuxe Cabinets by Seeger.

Application of the continuous hinge and special design to and for refrigeration Cabinet construction is a successful development by Seeger engineers — its use permits the severe lines conforming to modern trend.

The unique lock with exposed Black Bakelite Handle only, is an adaptation of Automobile door lock to Refrigeration Cabinets — equipped with cylinder lock and key.

These Cabinets have been designed to give greater beauty to Seeger traditional quality. Can be obtained in 6, 8, 10 and 14 cubic feet capacity.

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660 North Wabash
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THE EXPANSION VALVE

Stories of Interesting PEOPLE in the Refrigeration Industry

By **GEORGE F. TAUBENECK**

Romantic souls have often been disappointed by intimate pictures of great inventors.

Thomas A. Edison, for instance, claims that "genius is 2 per cent inspiration and 98 per cent perspiration." To substantiate this statement he points out that he evolved the electric light, the phonograph, the moving picture and scores of other great inventions by toiling terribly.

But let our romanticists take courage, for we have discovered an inventor after their own hearts, a crystal-gazer who takes (he claims) his inventions out of the thin air in the dead of night.

His name is Samuel E. Link, and he is the inventor of the ice cream vending machine (described in the Refrigerated Food Section of this issue) which was exhibited at the convention of the Coin Machine Operators' Association held recently in Cleveland.

For 18 years Link toured the footlighted boards billed as "Alexander the Great"—a mind reader. He was one of those seers who tell selected individuals in the audience what's on their minds and what to do about it.

Nowadays he utilizes this training, he says, in inventing things. You tell him what you want invented, he goes into his own variety of trance, and comes out with a plan for the invention.

His inventions are never revised after he gets the inspiration, he claims, but invariably work the first time they are tested. Like Minerva, they spring full grown out of his mind. At least, that's his story, and he sticks to it.

* * *

Charles Francis Coe

A first rate hoax was perpetrated upon some 700 innocent members of the refrigeration industry at the G. E. convention in Cleveland last week.

It was announced that Floyd Gibbons, triple-tongue radio spieler, would speak to the gathering.

Fanfare of trumpets. Expectant hush. Up rolled a curtain, and there, peeking through the scrollwork of a gigantic radio cabinet, was a grinning behemoth with a white patch over one eye.

With a "hello everybody" he bounced down to the stage, took a wide stance before a microphone, and began reading a message to the group with a speed which would have outrun the fabled Dame Van Winkle by a double-jointed syllable over a 10-minute test.

He was built like a varsity tackle, and was as handsome as he was brimming with life.

The crowd felt it had received its money's worth, and settled back preparatory to giving the once-over to the next celebrity announced—Charles Francis Coe, another of "Swag" and other quick-trigger gangster novels.

Again the expectant hush. Then through curtains the same grinning young giant poked his head. Stepping out into full view, he removed the white patch from his supposedly missing eye. The eye was whole.

The audience was as astonished as might be a man who would strike a match on the Chrysler building and see the whole skyscraper burst into flames. A miracle had occurred.

Drawing the veil from the mystery, the giant explained that Gibbons had been delayed, and that he (Charles Francis Coe) had volunteered to substitute for the noted radio word-whirler.

Coe then proceeded to make a neat little speech which put the thunderstruck "Toppers" and distributors at their ease again.

* * *

Floyd Gibbons

At the convention banquet following the hoax, Floyd Gibbons was there in the flesh. He didn't make any speeches, but he was easily distinguished by his white eye-patch, and was gazed at a great deal.

He, too, is large and animated. He has a constantly flushed face, mobile lips, and the alert, nervous movements of a prowling tiger.

Friday morning he spoke to the convention.

"I feel that I'm just as much a G. E. salesman as any of you 'Toppers'," he said. "I'm selling the General Electric Co. over the radio to a listening nation; you're selling one of its products to individuals."

"I like selling, and I like my job," he concluded. "When I began giving these oral excursions into the House of Magic, I suppose I knew and cared as little about engineering and scientific research as the law would allow.

"I've capitalized on that lack of knowledge, and on the difficulty I have in acquiring it. When Larry Hawkins finally pounds into my head the explanations of the wonders I see, they have been reduced to such simple terms that any of my listeners can grasp their significance in no time at all."

* * *

General Pershing

According to Gibbons, General Pershing got wind of the fact that the former war correspondent was going to tell his radio audience that "Black Jack" Pershing did not say: "Lafayette, we are here."

Pershing thought something should be done about it, and telephoned Gibbons in Schenectady from Washington.

"Let me talk to Floyd Gibbons," came the voice over the wire. "This is General Pershing."

The Schenectady operator had been kidded by experts.

"Oh, yeah?" she nasaled. "Well, General Pershing, do you know who this is?"

"No," answered the surprised soldier. "Who is this?"

"Little Bo-Peep!" shot back the girl at the switchboard.

* * *

Steenstrup, Matsinger

One of the most dramatic moments of the "Monitor Top" convention came when Chris Steenstrup, head of the refrigeration engineering department, shook hands with Albert Matsinger, leading salesman.

In the brain of the first was conceived the design of the machine. By the wits of the other the machine was sold to the consumer. They represented the Alpha and the Omega of the organization. All others were middlemen.

Steenstrup is what is commonly known as a "personality." Broad of visage, grin, shoulders, accent and girth, he is also broad in his range of human affections.

He seems to bear a great love for his fellows, a love which is reflected in their eyes. He was one of the most popular figures at the convention, and one of the most respected.

Matsinger is a type of man who will stand out in any crowd. Not because he is striking physically, for he is of average height and weight, is partially bald, and dresses inconspicuously. But there is a keenness about his eye, and a decidedness to his movements that stamp him as one who knows where he's going and how to get there.

He is neither the jolly, round-headed salesman type, nor the driving, aggressive long-head. He is an individual—a confident, sure-footed, unabashed man who seems always to know what the next move is.

Any man who can sell more than $104,500 worth of domestic refrigerators in one year deserves a wholesale doffing of hats. And he got it.

* * *

Cole and Cooper

Rex Cole is long, bald, up in years. R. Cooper, Jr., is short, young, and has a wealth of carefully groomed black hair.

The former is G. E. distributor in New York City; the latter holds the same franchise in Chicago. They are great opposites, great rivals, great friends.

Cole is forceful, aggressive, dominating. He inspires men to work hard, to stay on the job, to expend extra effort. Cooper is immaculately neat, as quiet as salesmen claim their refrigerators to be, and as self-possessed as an ambassador.

Cooper's methods are those of the strategist, the tactician, the chess player. Cole is spectacular, inspirational, militant. Both achieve noteworthy results, and make money—a lot of money.

To help prove our inference that Success does not single out any one type for the reception of her gifts, it might be added that among the "Toppers" (men who sold more than $25,000 worth of electric refrigerators in 1930) were men ranging from 5 feet, 2 inches to 6 feet, 4 inches in height; from 118 pounds to 300 pounds in weight; and from 21 years to 65 years in age.

* * *

Dramatic Critic

When "The Expansion Valve" was first started, the writer was told he could ring in books, sports, the stage—anything so long as it would interest those who sell electric refrigerators.

One novel has been mentioned, and sports have crept in occasionally, but to date this is our first attempt at dramatic criticism. Too many interesting people are hooked up with the refrigeration industry for a columnist to wander very far afield in search of material.

We'd like to grasp this chance, though, to put in a good word for the histrionic talents of Julia Grosscup, a stenographer in the G. E. home office.

She appeared in a skit, "The Training of the Shrewd," along with Paul Dow, "Dad" Norling, and other good amateur actors, before the G. E. convention.

Julia, all hands agreed, had the poise of a professional. And some grace and charm a professional might envy.

Norling, as the recalcitrant old hardware dealer, was a gem. We've seen hardware dealers who looked and talked like that.

In the first act of the playlet he was constantly asking the various principals of the cast for a match. When the curtain rose for the second act, the "Toppers" were prepared.

"Give me a match, somebody," said the old man.

Whereupon an avalanche of matches descended upon the stage from all parts of the theatre. There were almost enough matches at his feet, when the shower was over, to keep a cob-pipe lit for 24 hours.

* * *

Quinn and "Zim"

"A sane mind in a sound body" was a copybook maxim which appealed to us greatly in our schoolboy days.

P. B. Zimmerman, manager of the refrigeration department of the General Electric Co., seems to like the old motto, also. It fits him like some evening gowns fit some women.

When listening to him talk, one observes the lucidity of his thinking, the clarity of his phrases, the absence of emotion, and a coolness that lacks but a few degrees of being downright cold.

Upon seeing him at close range, one is struck by his ruddy complexion, his carriage, and his clear eyes. There is a noticeable spring in his step. He gives the impression of being meticulous about his health.

T. K. Quinn, his predecessor, has already been a topic for delineation in this column. His ability to dramatize and humanize the things he touches, which we noted then, was exemplified strikingly at the convention.

His speech was both the chronological and psychological climax of the two-day gathering. The men there had looked forward for weeks to this speech, nor were they disappointed.

To the platform he brought a richly stored mind and a warmth of human feeling which, augmented by the forensic proclivities he possesses in common with many Irishmen, were irresistible.

After preambling upon the contagion of enthusiasm and the duty of sharing burdens, he had the curtains withdrawn to reveal a G. E. refrigerator.

"I think a lot of this fellow," he said, putting the refrigerator on its shoulder. "He is a very human fellow. His given name is General Electric. His surname is Refrigerator.

"He has strong legs and a large head. He is reputed to be cold, but when he is working, if you listen carefully, you can hear his warm heart beating. He is tightly sealed, but he opens once-in-a-while. He has learned the lesson of give and take.

"He is a world citizen, and is on intimate terms with people everywhere. He knows more about baby's milk than dairies do, and more about father's ice cubes than the Wickersham commission.

"He has given employment to 20,000 persons. He supports, feeds and clothes 100,000. He serves a million families—five million persons—faithfully, continuously.

"I'm tremendously fond of him. But my emotion, I'm sure, is no more than that which you feel."

Later in his speech he discussed specialty selling in these words:

"Salesmen are pioneers. The man with an order in his hand is a constructive force. There will always be a field for specialty selling.

"If you fear that electric refrigerators will eventually become over-the-counter merchandise, you are probably right.

"But that won't happen before 10 years are gone—at least, that's my guess. And long before that time, there will be other things needing pioneering."

* * *

Dealers and Dollars

Salesman Fagan, of the Cleveland Frigidaire force, maintains that destructive competition pushed a sale right into his hands the other day.

Another salesman had told a housewife how many gadgets a Frigidaire had that weren't on his machine. "Frigidaire has so-and-so—we've eliminated that," he would say.

He didn't count on woman's native curiosity. The prospect decided to see what these things were that Frigidaire hadn't eliminated, walked into the salesroom, saw them, and bought a machine.

The Euclid Music Co. of Cleveland, has a Majestic refrigerator on display in a front window.

Posters announce that it will be given away to the person who guesses nearest correctly the number of days, hours, minutes, and seconds that several bottles of milk now in the refrigerator will remain sweet.

O. F. Milligan sells Electrolux refrigerators to Middletown, Ohio, families. He has sold 50 since getting the franchise in 1929. Also among his wares are Atwater-Kent, Sparton and Zenith radios.

"I sell chiefly to professional men," says Milligan. "My prospects have to be independent thinkers. Those who are disturbed by new ideas don't take kindly to modern refrigeration."

One of a small clan of radio dealers who made money last year, Milligan attributes his profits to the fact that he steadfastly refused to cut prices, and that he sold quality merchandise to a quality market.

O. G. Morris, another Middletown dealer, has a floor display of G. E. refrigerators embellished with two kinds of fixtures: lighting and bathroom.

In the last three years he has sold more than 100 refrigerators in Middletown and environs.

LARKIN COILS

U. S. Patent No. 1,776,235

100% VERTICAL SURFACE

Approved Nationally *by* . . . **Manufacturers, Distributors** *and* **Consumers**

The employment of Larkin 100% Vertical Surface Aluminum Plate Coil (Patented) has grown tremendously during the past year.

Leading manufacturers (see Trade Marks) have adopted this coil as Standard Factory Equipment. Distributors and dealers say they are real sales assets. Users find them best because Larkin Coils eliminate the dehydration and defrosting problems and reduce servicing.

93 SIZES MADE

Largest Line on Market

A size Larkin Coil for every commercial need and an efficient plant to turn out any special size within 24 hours. Full facts on these marvelously efficient coils from manufacturers listed here or direct from the originators and manufacturers.

LARKIN WARREN Refrigerating Corporation

Originators and Mfrs.

ATLANTA - - GA.

Copeland DEPENDABLE the Key to Refrigeration DETROIT, MICH.

SERVEL Electric Refrigeration

TRUPAR DAYTON.-OHIO

UNIVERSAL~ DETROIT, MICH.

WILLIAMS ICE-O-MATIC REFRIGERATION BLOOMINGTON, ILLINOIS

B-K, Junior New Brunswick, N.J.

Zerozone Lifetime Refrigeration

Absopure DETROIT, MICH.

M&E Electric-Automatic REFRIGERATOR PHILADELPHIA

KULAIR PHILADELPHIA, PA.

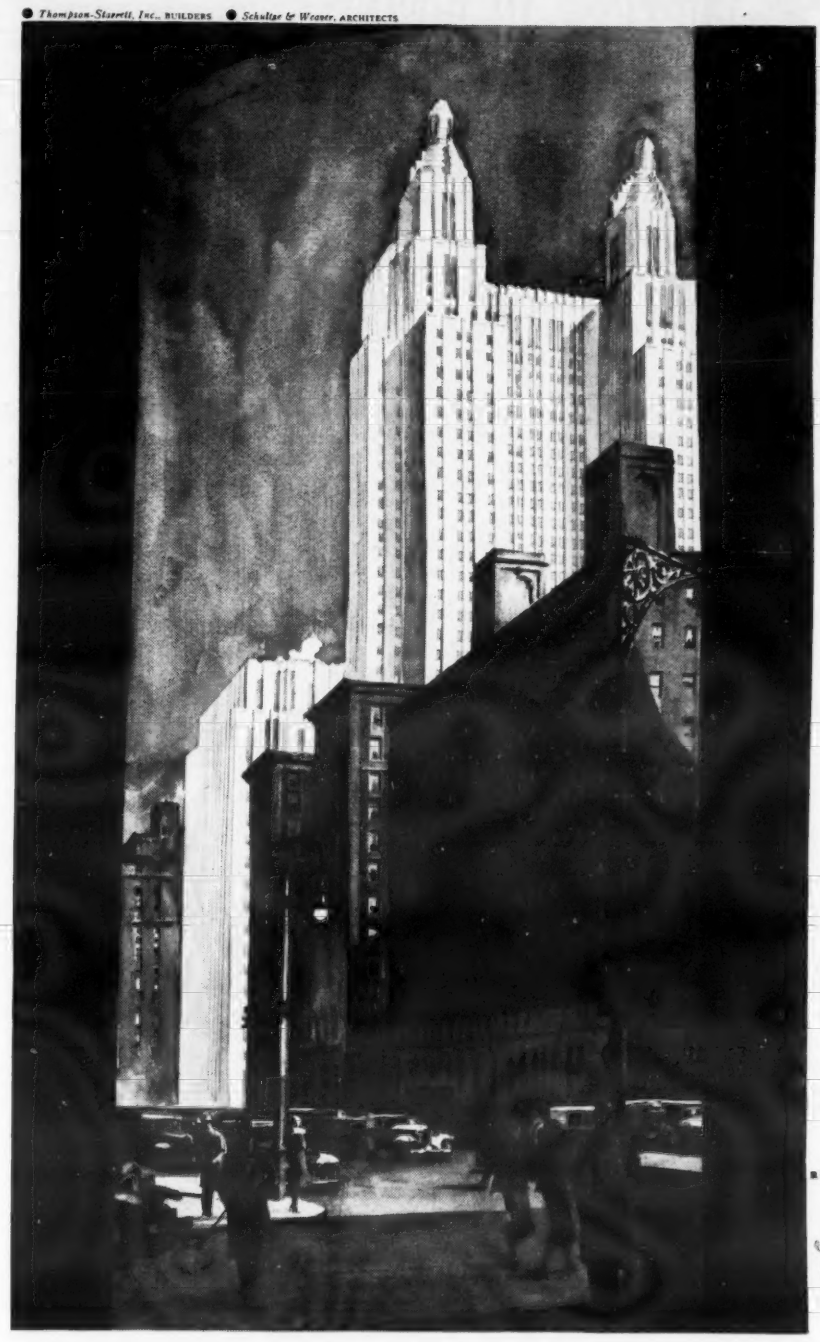
JACK FROST REFRIGERATION, ltd. TORONTO-CANADA

Modern

POTTER PORTLAND, O.

Wayne FORT WAYNE, IND.

ADVANCED REFRIGERATION



ADVANCED REFRIGERATION

Citadel of the gracious art of modern living

THE NEW WALDORF ASTORIA

Few, indeed, were the hotels throughout the world, whose reputations for excelling in the gracious art of living could compare with that of the former Waldorf-Astoria. Today a new Waldorf-Astoria rises majestically above the throbbing pulse of Park Avenue . . . twin towers of gray, whose chaste simplicity reflects harmoniously the vibrant spirit of our times. In design, construction and appointments only one standard was ever considered—the best.

Frigidaire has been chosen, not only by the Waldorf-Astoria, but by hundreds of other leading hotels and apartments throughout the world, where quality, beauty and quiet operation are the sole deciding factors in selecting refrigeration.

This same new, quiet Frigidaire—with its cabinet of sparkling white porcelain-on-steel and with features that contribute the utmost in convenience, economy, healthfulness and permanent satisfaction—offers a new standard of advanced refrigeration for any home or apartment, no matter where it is situated. If you apply the same high standards of excellence as the Waldorf-Astoria, and other world famous hostelries . . . for you, too, there can be but one choice—*Frigidaire*. Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

Frigidaire
A GENERAL MOTORS VALUE

AS AN EVIDENCE OF THEIR QUALITY THE NEW WHITE PORCELAIN FRIGIDAIRES ARE SOLD WITH A THREE-YEAR SERVICE GUARANTEE

THE advertisement reproduced above, and which recently appeared in New York newspapers, is typical of many advertisements which Frigidaire is privileged to run each year. • • • For where the only standard considered is "the best," almost invariably the choice is Frigidaire. • • • And this fact holds a double significance for Frigidaire dealers. It means immeasurable benefits from prestige-building advertising — and a sales opportunity that only a high-quality line can offer.

FRIGIDAIRE CORPORATION . . . *Subsidiary of General Motors Corporation* . . . Dayton, Ohio

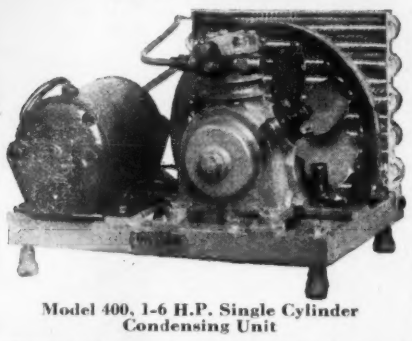
Frigidaire
A GENERAL MOTORS VALUE

THE NEW ALL WHITE PORCELAIN-ON-STEEL FRIGIDAIRES ARE SOLD WITH A THREE-YEAR SERVICE GUARANTEE

DICELER
ELECTRIC REFRIGERATION

—PRODUCTS—

A SERVICE TO THE REFRIGERATION INDUSTRY



Model 400, 1-6 H.P. Single Cylinder Condensing Unit

PRECISION BUILT COMPRESSORS and COMPLETE CONDENSING UNITS

for Electric Refrigeration Manufacturers, Distributors and Dealers

Our plan allows the assembler to advertise and sell under his own name.
Sizes for 1/6, 1/4 and 1/3 H. P.
Sulphur dioxide and methyl chloride condensing units.
Ideal for domestic refrigerators, ice cream cabinets, water coolers and small commercial installations.
Prices lowest in the history of electric refrigeration.
Full details given on request.

Deissler Machine Company
Greenville, Pa.
Manufacturers of complete domestic and commercial refrigeration systems

McELHINNY REPORTS UPTURN IN BUSINESS

Mt. Clemens, Mich.—W. D. McElhinny, vice-president in charge of sales of the Copeland Sales Co., returned February 28 after attending five district conventions of Copeland dealers in the east.

Conventions were held in New York City, Albany, Syracuse, Philadelphia and New Haven.

"There is a noticeable improvement in conditions in the East," Mr. McElhinny stated. "Dealers reported that general business conditions in their territories are better than they have been in a long time.

"Business, they say, is definitely on the upgrade and people are much more hopeful for this reason. Unemployment is decreasing as a result, and retail business is profiting from the increased purchasing power of the workers."

TRUPAR OFFICIAL SPEAKS AT CONOVER CONFERENCE

Salina, Kans.—Dealers and salesmen operating in this territory under the Richard Conover Hardware Co. of Kansas City and Oklahoma City recently attended a conference here for the purpose of inspecting the new Trupar electric refrigerators.

R. L. Lancaster and H. W. Falls of the Kansas City offices, and B. K. Williamson of the Trupar Mfg. Co., Dayton, Ohio, attended the meeting and discussed sales plans with the dealers and salesmen.

This was one of a series of meetings which were held by the Conover company throughout the territory to acquaint the field organization with the Mayflower refrigeration line which the company is now distributing.

New Frigidaire Model

Looking over the W-8 model in the new Frigidaire line, which was recently placed on the market. One of the features is the addition of high legs finished in porcelain.

FRIGIDAIRE REPORTS LONGER GUARANTEE

(*Concluded from Page 1, Column 1*)

acid-resisting and said to be immune to food stains. The legs are finished in porcelain. They may be removed and replaced by casters if the purchaser desires. All hardware is chrome plated.

The models will be known as the W-3, W-4, W-5, W-6, W-8, W-10, W-12 and W-18. The W-18 is a four-door model, the W-12, W-10 and W-8 have two doors and the others are of the one-door type. Shelf space has been increased, and ranges from six and one-fourth square feet in the W-3 to 27 square feet in the W-18.

The "quickube" tray introduced last year is standard equipment in all except the W-3 and W-4 models. Two such trays are supplied in the two largest models. The "hydrator" is standard equipment in all models.

The W-3 and W-4 have two freezing trays with a capacity of 30 cubes, or four pounds of ice, at one freezing. Three trays, with a capacity of 63 cubes, or 9 pounds of ice, at a time, are provided in the W-5 and W-6.

The W-8 and the W-10 have three trays with capacity of 72 ice cubes, or 10⅛ pounds of ice. The W-12 has four trays which are capable of freezing 96 ice cubes, or 13½ pounds of ice, at a time, and the largest model has six trays and an ice capacity of 144 cubes, or 20¼ pounds at a freezing.

A deep storage compartment for keeping ice cream, fresh meats, poultry and similar foods at freezing temperatures, or below, is available for all models having three or more freezing trays.

A removable grid between two of the trays makes it possible to use this storage compartment in place of two freezing trays. All ice trays are made of aluminum, especially treated to retain the lustre.

The coil front is finished in porcelain, as is a shield that separates the coil from the food compartment.

A number of "super-duty" coils of the cross fin type are included in the new Frigidaire commercial line. There are nine air-cooled compressors, which will be known as the AA-120, A-125, AB-133F, A-125E, A-233E, A-233, A-375, A-4100 and A-5150 and four water cooled jobs, to be known as W-233, W-350, W-475 and W-5100.

Issued with every Frigidaire household model is a warranty which reads as follows:

"We warrant every new, all-white porcelain Frigidaire, models W-3, W-4, W-5, W-6, W-8, W-10, W-12, and W-18, to be free from defect in material and workmanship under normal use and service, and we will, within three years from delivery to the original purchaser, replace without any cost to the customer, any part or portion thereof which our inspection proves to be thus defective.

"This warranty does not apply to any material which has been subject to misuse, neglect, or accident; is in lieu of all other warranties, expressed or implied; and we do not authorize any person or representative to assume for us any other liability in connection with our products.

KELVINATOR DISTRIBUTORS HOLD DEALER MEETINGS

Detroit—Spring dealer meetings were held by Kelvinator distributors at San Antonio, Louisville, Boston, Pittsburgh and Syracuse during the last few weeks.

At San Antonio, J. S. Cortines, regional director, H. W. Browne, district manager, and C. M. Armstrong of Kelvinator Corp., Detroit, addressed dealers of the Neches Electric Co.

J. S. Sayre, sales manager, Vance Woodcox, sales promotion manager, both of Detroit, E. L. Triffit of Brooke, Smith & French, Inc., Kelvinator advertising representatives, and S. Camper, district manager, were on the program at the Stratton & Terstegge meeting at Louisville, February 25.

The Standard Talking Machine Co., new distributor at Pittsburgh, held a large meeting at which George W. Mason, Kelvinator president, H. W. Burritt, vice-president in charge of sales, A. M. Fernald, commercial manager, and C. M. Armstrong were the chief speakers.

Syracuse was the scene of a dealer meeting March 2 at which Meachem-Fenn, Inc., distributor, was host. A M. Taylor, advertising director, represented the factory.

More than 100 dealers attended the session of the Kelvinator Sales Corp. at Boston, February 25. A. M. Taylor, advertising director, and A. S. Adams, auditor of branches, both of the factory, spoke to the dealers.

FIR-TEX GETS BIG ORDER

St. Helens, Ore.—The Fir-Tex Insulating Board Co. will shortly be running at full capacity in order to fill an order for 15,000,000 sq. ft. of insulating board placed by the Kelvinator Corp. of Detroit. This order will take one-fourth of the estimated output for 1931.

CONDENSATION

An Enemy To Metal Cabinets

Superior Galvannealed PATENTED PROCESS

"Superior Super-Metal" PATENTED PROCESS

THESE sheets are recommended for use where unusual corrosion-producing conditions are present. They combine superior rust-resisting qualities, along with durability, workability and fine appearance. They take paint, lacquer or baked enamel readily, without special treatment, and it adheres satisfactorily. The coating will not chip, flake or peel, and it will withstand difficult forming without fracture.

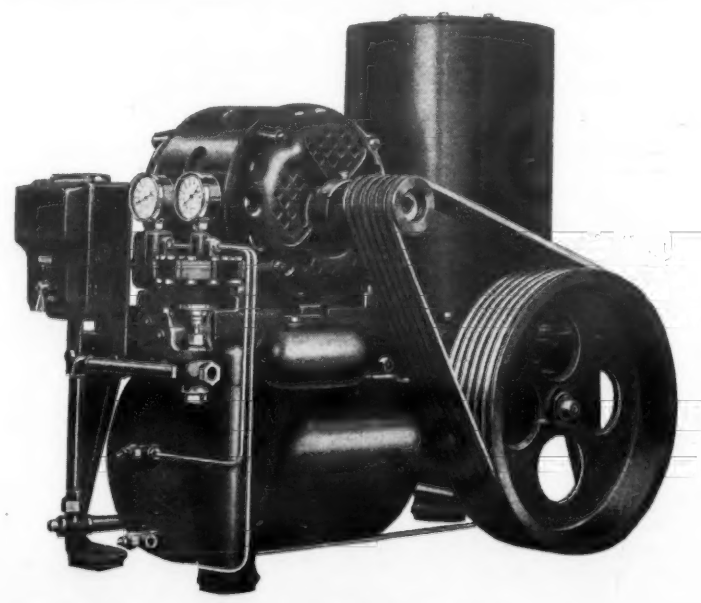
These sheets are especially suitable for refrigerator, ice cream and various cabinets.

SUPERIOR-METAL is a Superior Quality, Patented Process, Zinc Coated Sheet especially suitable for cabinet work.

Samples and Booklet on request

Manufactured by

The Superior Sheet Steel Company
Canton, Ohio
Division of Continental Steel Corporation, Kokomo, Indiana
Operating Plants at Kokomo, Indiana, Indianapolis, Indiana—Canton, Ohio



EXCELSIOR REFRIGERATING MACHINES

offer you the most attractive Dealer Proposition in the entire refrigeration field. These sturdy and attractive commercial units are right up-to-the-minute in mechanical features and thoroughly perfected in every detail. They are backed by Carbondale's 40-years' experience in the Refrigeration Industry.

WRITE TODAY FOR FULL INFORMATION.

THE CARBONDALE MACHINE CO.
CARBONDALE, PA.
EXCELSIOR DIVISION, SOUTH NORWALK, CONN.

The NEW Improved ELECTROLUX *offers* 5 Additional Models 15 New Features

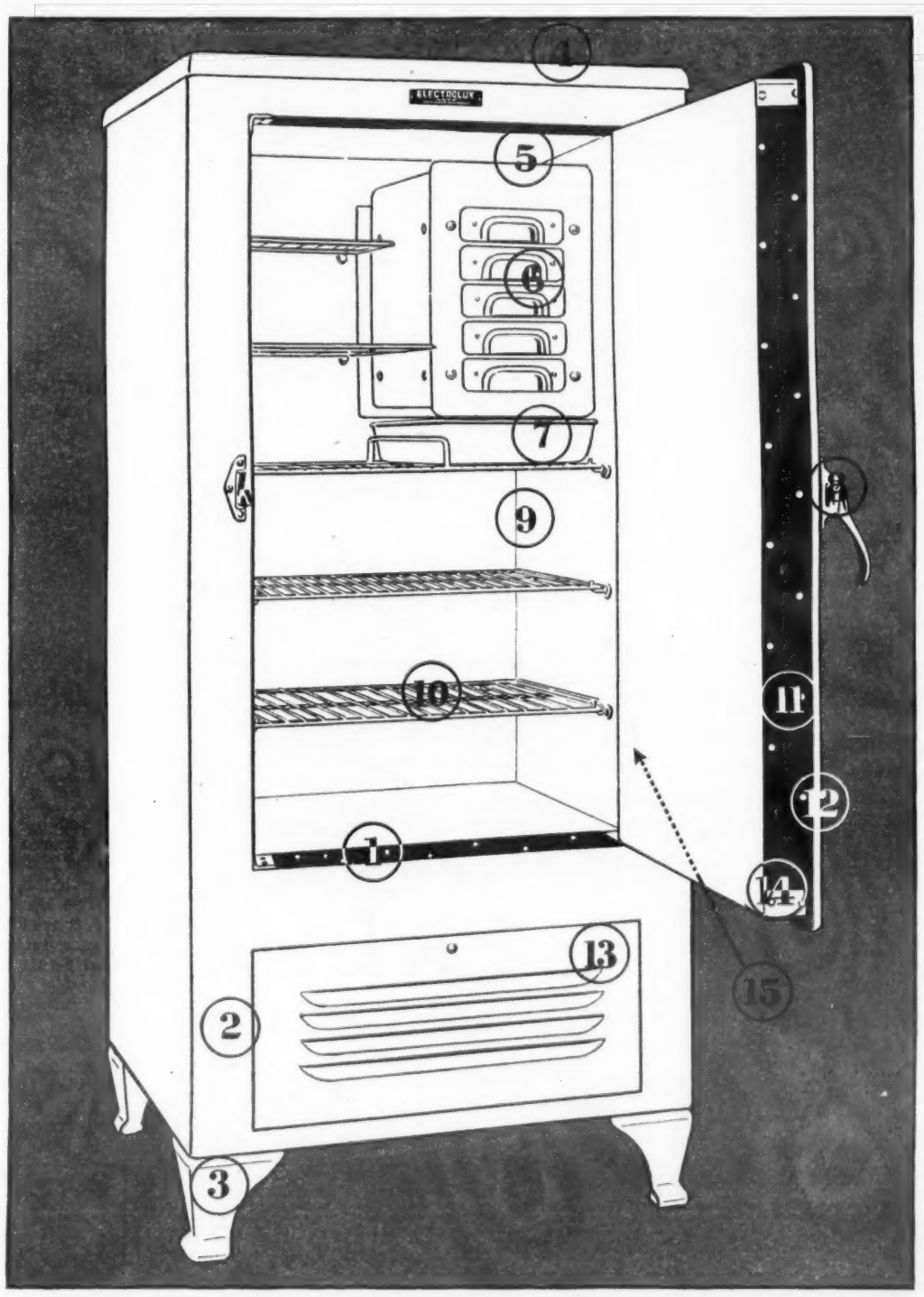
THE SIMPLE, reliable Electrolux principle couldn't be improved—but we've made the cabinets more luxurious than ever Like the thousands that have gone before, the new 1931 models offer the same sound advances in operation that have brought Electrolux its popularity. No moving parts—no noise—lower operating cost—*plus 15 new practical features.*

Check them over and see how the new Electrolux is better built, better looking than ever before. Housewives, prospects, can see and understand these features. They are the things that will make gas refrigeration more popular than ever.

Five new household and *commercial* models have been added to the eight regular household types. Among the newcomers are a special buffet box—called the Westchester. An ice-cream cabinet and a storage refrigerator. Every grocery, delicatessen, club, dairy can now have trouble-free gas refrigeration. To this field, too, Electrolux will bring the silent, dependable service that has so long characterized its performance in households. Electrolux Refrigeration Sales, Inc., Evansville, Indiana.

ELECTROLUX

THE *Gas* REFRIGERATOR



15 Important Features of the NEW IMPROVED ELECTROLUX

1. Panelite door frame trim with chromium-plated screw heads.
2. Exterior of standard Electrolux quality.
3. New artistic all-white legs. Easy to clean under cabinet with broom or mop.
4. Smooth flat top. Can be used for table top or dish storage.
5. Good-looking Chilliator assembly, porcelain covered.
6. Individual, self-sealing tray fronts of chromium. Cannot rust.
7. Practical chill tray arrangement. Gives more shelf room . . . eliminates waste of storage space.
8. Trigger-snap door latch of chromium plate. Facilitates opening and closing of door.
9. Beveled corners inside . . . easy-to-wipe porcelain lining. Makes cleaning easy.
10. Ribbon-type shelves. Prevents bottles and dishes from tipping over.
11. Panelite door trim with chromium screw heads.
12. Improved long-life gaskets.
13. Automatic gas lighter.
14. Chromium-plated hinge-brass door corners and door-frame corners.
15. Chromium-plated hinges in modern relief design.

RUTHENBURG THINKS SALES MAY INCREASE

THE year 1930 can well be said to mark the passing of electric refrigeration from a minor to a major industry, Louis Ruthenburg, president of Copeland Products, Inc., Mt. Clemens, Mich., and chairman of the Refrigeration Division of the National Electrical Manufacturers' Association, says in a statement issued March 5 on the electric refrigeration industry.

"Frequently the newer industries suffer most during times of retrenchment," Mr. Ruthenburg said. "This is because the younger enterprises have not had time to develop the stability, resources and public acceptance with which to weather periods of business stress. Industries that come through periods of recession with a relatively favorable showing of strength are acknowledged to be the basically sound business of the country.

"In 1930 practically all industries showed a certain amount of recession, and this was only natural as a reaction from the boom year of 1929. Under such circumstances a falling off in volume did not necessarily indicate an unsound condition. It is at most but an adjustment in keeping with the law of action and reaction.

"Contrasted to the general falling off of business in most lines is the striking fact that not only had the comparatively new industry of electric refrigeration held its own, but it had actually gone forward, setting new high marks for all time.

Commodity Production Declined

"Production of such commodities as automobiles, coal, crude oil, lumber, pig iron, declined, as did chain, department store and mail order house sales, sales of stocks and bonds, etc. Exports, imports, freight car loadings, building contracts, railroad earnings, new financing and employment likewise did not reach the high levels of 1929.

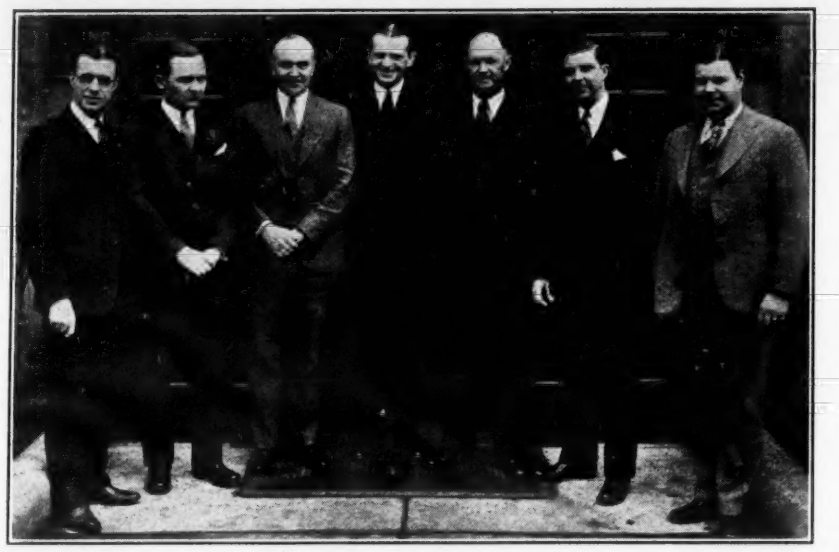
"The sales of electric refrigerators for the first two months of 1931 indicate that 1930 rate of increase will be maintained and very probably exceeded this year.

"It has been freely prophesied that certain other industries would lead in the return to normal, whereas it has actually been the electric refrigeration industry that has taken this lead. Various other lines are reporting gains in sales and production, and this return to normal will further add to the gains made by electric refrigeration.

"The extent of growth of the domestic refrigeration industry and its size are indicated by the census figures. These show that in 1927 there were 22 manufacturers of mechanical refrigerators and in 1929 there were 32. The dollar value of the output of the industry increased from $128,700,000 in 1928 to a total that is estimated at $223,330,000 in 1930. Based on the records of the various manufacturers reporting for the first two months of the year, 1931 should attain a volume considerably above $250,000,000.

"The foregoing figures cover only domestic refrigeration statistics. That type of commercial electric refrigeration marketed by makers of household machines and suitable for groceries, meat markets, delicatessens, hotels, restaurants, florists' shops and similar applications is an increasingly important factor. The number of commercial units sold in 1930 is estimated at 233,000, with a valuation of $156,800,000, as against 172,000 units sold in 1929."

Zone Men Attend Meeting



(Left to Right)—F. G. Parker, Boston; C. A. Miller, Chicago; H. L. Bickel, Evansville; William Reynolds, New York City; A. L. Spring, Los Angeles; B. O. Brown, New York City, and R. B. Moore, Evansville.

* * *

ELECTROLUX SUPERVISORS VISIT EVANSVILLE FACTORY

Evansville, Ind.—Electrolux zone sales supervisors and executives of the sales organization recently completed a six-day intensive training period at the factory, ending Feb. 21, during which time sales policies, advertising plans and campaign efforts were outlined.

F. E. Sellman, vice-president in charge of distribution, who was in charge of the meetings, was assisted by George L. Roach, assistant sales manager.

The zone supervisors who attended were: B. O. Brown, New York; C. A. Miller, Chicago; F. G. Parker, Boston; A. L. Spring, Los Angeles, and H. L. Bickel, Evansville. William Reynolds, advertising manager of New York, was also present and explained the advertising schedules for the year.

In addition to the sales and advertising meetings, supervisors were also given an opprtunity to learn of the latest developments in the factory educational school, which is under the direction of R. B. Moore, instructor.

BENNETT COMMERCIAL DEPARTMENT MOVES

San Francisco, Calif.—The commercial department of L. H. Bennett Co., Ltd., has been moved to 635 Mission St., here. R. J. Bishop is manager.

Distributor Signs 63 New Dealers

Kansas City, Mo.—The refrigerator department of the Sterling Radio Co. has signed up sixty-three Majestic refrigerator dealers in this territory since the first of this year.

L. C. Truesdell, advertising manager of the company, has been made traveling representative. H. E. Drier, Sterling treasurer, has taken charge of the advertising department.

Norman Wilson, service manager, assisted by George N. Livingstone, is conducting sales schools for dealers.

From one to three classes daily are held and special emphasis is being placed on the health feature of electric refrigeration.

H. C. Bonfig, vice-president of the company, and C. M. Willis, of the advertising department, held a conference in Burlington, Kansas, with fourteen Majestic salesmen connected with the Pioneer Music Stores, which are scattered over three counties in Kansas.

Jack Murphy, formerly sales promotion manager for the Frigidaire distributor here, was recently appointed refrigerator sales manager in charge of the Majestic department of Mace-Ryer Co. He organized a force of eighteen salesmen, who are now engaged in a month's contest that will end March 15.

The Owl Hardware Co., Bonner Springs, Mo., was recently granted a franchise to handle Majestic refrigerators.

NEW TEXAS COMPANY WILL DISTRIBUTE KELVINATORS

Dallas, Tex.—The north Texas distributorship for Kelvinator has been assumed by the Harrison-Smith Co., 2121 Commerce St., here. Retail Kelvinator sales in the city of Dallas will also be handled by the same company.

The Harrison-Smith Co. has remodeled its four-story building in Dallas to accommodate the Kelvinator display rooms and retail sales division. The company, also distributor for Atwater-Kent radios, has added more than fifty people to its Dallas organization.

A. J. Harting will direct Dallas retail sales, and Neil Smith will manage commercial sales. Fred Beardon will have charge of the installation and service department.

DUGGAN TRANSFERRED TO NEW BRITAIN, CONN., UTILITY OFFICE

New Britain, Conn.—Charles A. Duggan has been appointed commercial manager of the Connecticut Light & Power Co. branch at 82 West Main St., Frigidaire dealer here, succeeding H. A. Stockbridge.

Mr. Duggan, who will have full charge of domestic and commercial sales of Frigidaire in New Britain and vicinity, was formerly connected with the Bristol, Conn., branch of the power company. The territory includes Newington, East Berlin, Berlin, Plainville and Kensington.

DALRYMPLE CO. OPENS NEW DETROIT QUARTERS

Detroit—Mr. Televox, the electrical man, was master of ceremonies at the formal opening of new showrooms for the Dalrymple Co., Westinghouse distributor, in the Stephenson Bldg., West Grand Blvd. and Cass Ave., March 5-7.

The Dalrymple Co. recently took over the Westinghouse franchise from the Good Housekeeping Shop, which is now acting in the capacity of a dealer. Dowd P. Dalrymple is president of the company.

Oklahoma Distributor Establishes Big Quota

Oklahoma City, Okla. — Oklahoma's Frigidaire distributing organization has launched a sales program, calling for increased activity to surpass the 1930 business figure, which was within about $50,000 of the banner year 1929, according to W. C. Dance, state distributor.

All representatives were present at the two-day state convention held here Feb. 17-18.

L. O. Smith, of Shawnee, was awarded first place in the district sales contest, P. Knudsen, of Tulsa, placing second. Awards were made by Harry Stewart, of Dallas, regional manager. Prizes totaling $1,950 were distributed for the final quarter of 1930.

Representing the service department of the national organization was R. F. Lehman of Dayton.

R. B. Ambrose, assistant regional manager, presented the factory sales program.

Other speakers on the program were: W. C. Dance, state distributor; E. B. Peters Duncan, who spoke for the dealers, and J. J. Shea, Oklahoma City, who presented the salesman's viewpoint.

G. E. ISSUES CAMPAIGN CONVENTION PORTFOLIO

Cleveland, Ohio—Two large portfolios for the use of distributors have just been issued under the supervision of August C. Mayer by the merchandising division of the General Electric refrigeration department.

One of these portfolios is a spring campaign prospectus, entitled "3 of the 5%," which is being sent also to central stations which merchandise G. E. refrigerators.

It treats prospect lists, special terms, sales helps, special displays, using the users, enlisting the aid of central station employees, and offers a plan for a "transcontinental blimp race" sales contest.

The other portfolio gives complete information on how to hold a distributors' convention. This is replete with attached pamplets and model circular letters. Clipped to the last page is an envelope and an order blank for promotional material, with two-cent and special delivery stamps attached.

SILENT AUTOMATIC NET EARNINGS SHOW DECLINE

Detroit—Net earnings of $156,023 were reported by the Silent Automatic Corp. for 1930, after all charges, including federal taxes, according to Walter F. Tant, president of the company.

This is equivalent to $1.11 per share on the outstanding common stock after provision for preferred dividends, and compares with total net earnings of $435,711 in 1929.

In commenting on the statement, Mr. Tant pointed out that net sales of the corporation for the same period were $4,790,316, against $4,737,386 for 1929.

The difference in earnings, it was stated, was due to the introduction and heavy sales of a new lower priced burner upon which the margin of profit was small.

OIL BURNER INDUSTRY PREPARES FOR SHOW

Philadelphia—Eighty oil burner and accessories manufacturers are expected to invade this city the week of April 13 to 18 for the Eighth Annual Convention and Oil Burner Show, according to Harry F. Tapp, executive secretary of the American Oil Burner Association.

Following the 1930 plan, the show will be open to the public. Prior to last year's experiment, when 10,000 people visited the show, exhibitions were for dealers only.

"Latest developments in the burner and accessory fields will be exhibited at the Philadelphia show," Mr. Tapp reports. "New models, incorporating mechanical improvements, recent engineering developments and new merchandising angles will make their first appearance."

Philadelphia convention headquarters will be at the Benjamin Franklin Hotel. Show headquarters will be found just across the street in the Gimbel Building. Members of the association will be given special registration cards for their authorized employees. Arrangements have been made with railroads for reduced fares on the certificate plan.

The convention will open on Monday, April 13, with meetings of the Executive Committee and the Board of Governors of the American Oil Burner Association at the Benjamin Franklin. The oil burner show will open at 7 p. m. that evening in the Gimbel Building.

Open Meeting for Dealers

The annual meeting of the Association, for members only, will be held on Tuesday morning. A special open meeting for dealers will occupy Tuesday afternoon.

Merchandising sessions will begin Wednesday morning under the chairmanship of Earl Marr, president of the Marr Oil Heat Machine Corp. Addresses by Haldeman Finnie, vice-president and general manager of the Timken-Detroit Co.; Lionel L. Jacobs, president of Electrol of New Jersey; H. Barley, vice-president of the Enterprise Oil Burner Co., and A. J. Fleischmann, treasurer of the May Oil Burner Corp., will be followed by an open forum.

On Thursday the merchandising sessions will be continued, with John A. Berghoff, general manager of the Wayne Home Equipment Co., in the chair. H. B. Dexter, assistant sales manager of the Petroleum Heat & Power Co.; J. Stowell, of the National Warm Air Heating Association, and J. T. Foley, chief auditor of the Richfield Oil Corp., will speak.

Friday morning there will be an engineering session at which John H. McIlvaine, president of the McIlvaine Burner Co., will be chairman. Speakers will include: P. S. Russell, of the Detroit Lubricator Co.; J. T. McFarnahan, general manager of the Holby Burner Corp.; Wiley Butler, of the Standard Oil Co. of New Jersey, and Prof. L. E. Seeley, of the Sheffield Scientific School, Yale University.

JOINS POWER CO. STAFF

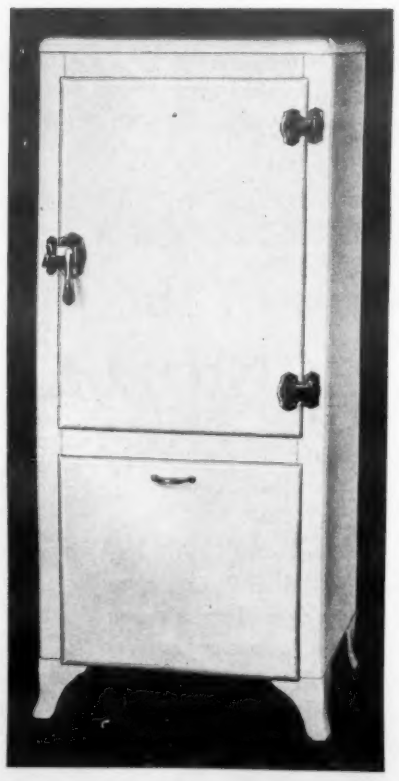
Springfield, Ill.—The Illinois Power Co., distributor for Frigidaire, has placed Frank Kunz in charge of merchandising.

Mr. Kunz was formerly in charge of the Frigidaire department of the J. A. Van Natten Hardware Co.

THE NEW

STARR FREEZE

Electric Refrigerators for 1931



of

Outstanding Beauty
Utmost Reliability
Incomparable Value

•

One of the New Styles

The Wabash

MODEL W

Three tray cooling unit.
Approx. 5 cu. ft. gross
Interior Porcelain.
Exterior Enamel.

•

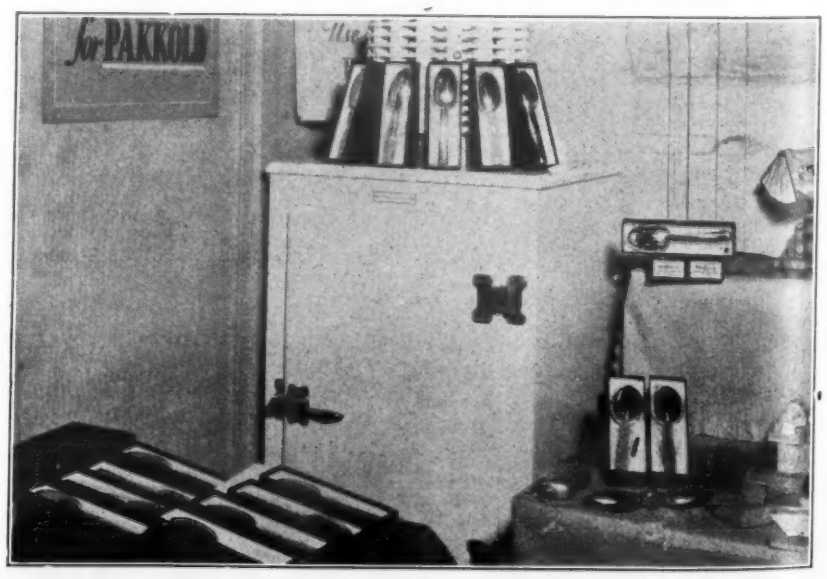
Our Liberal Dealer Proposition

is an unusual story of profit for you. Write at once for it.

THE STARR COMPANY

RICHMOND, INDIANA

Pakkold, Koldpak Displayed



LeBarque Exhibit at Chicago Gift Show

Chicago—New cooling devices, known as Pakkold and Koldpak, for use with mechanical refrigerators, were demonstrated by the LeBarque Co. at the recent Gift Show held at Merchandise Mart.

The Pakkold beauty model for facial application, the Koldpak medical model C for head and appendix cold treatment, and the Koldpak medical model D for cold treating tonsils were displayed.

The Pakkold is designed for use by the housewife. Polished and heavily plated with chromium, the bowl has a peculiar shape, one side of instrument being rounded to fit the curve under the neck, while the other side is a flatter surface for use on the cheeks. The Catalin handle is obtainable in a number of colors.

By placing these devices in the chilling compartment of an automatic refrigerator, the liquid contained within the metallic shell freezes.

WESTINGHOUSE

opens up a new, rich market with a "Completely Balanced"

ELECTRIC REFRIGERATOR

for modern apartments and small homes . . . .

to retail at only $180

F. O. B. FACTORY

Every inch a* WESTINGHOUSE. *Nothing omitted. Nothing compromised.

***The most "Completely Balanced" small model in the field and* a whale of a value.**

MORE than a year ago the WESTINGHOUSE line of *"Completely Balanced"* automatic electric refrigerators was introduced into selected concentrated markets. With the prestige of the great WESTINGHOUSE name, superb custom cabinets and many improved features, public acceptance was immediate.

Now, with mechanical efficiency and public acceptance *proved*, the WESTINGHOUSE Refrigerator line—plus this new $180 apartment-size model—is being offered to alert dealers in Texas, Oklahoma, Kansas, Nebraska and the Dakotas, as well as the East.

WESTINGHOUSE Goes National!

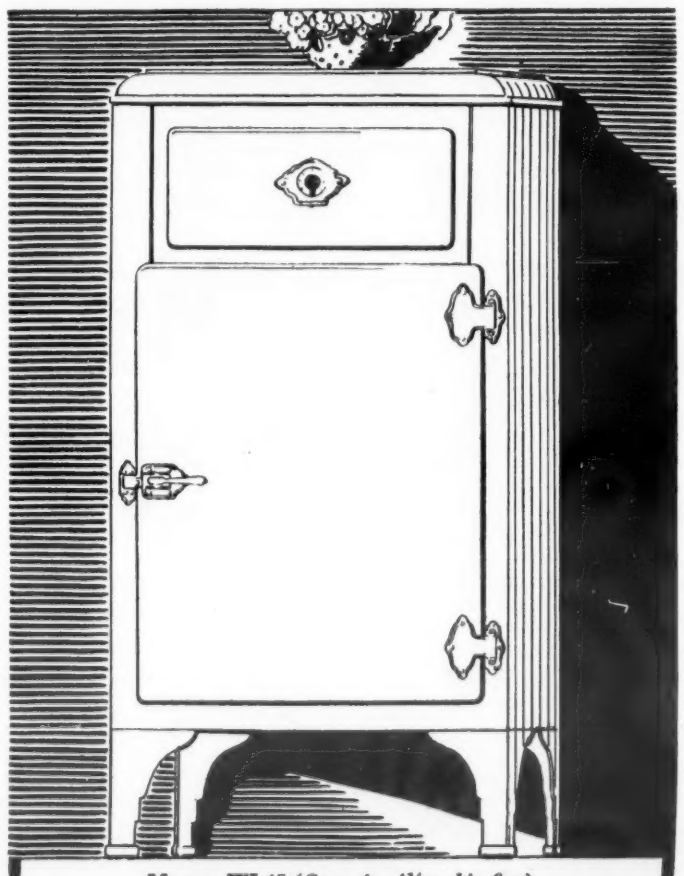
***Outstanding National Advertising now appearing in leading publications during* 1931**

Behind their dealers WESTINGHOUSE has placed not only a pre-proved product and the priceless selling value of the WESTINGHOUSE name and reputation—*but* national advertising and merchandising help of *vast proportions during* 1931.

The most outstanding National Advertising Campaign in the industry will carry the convincing story of WESTINGHOUSE "economy-assurance" into millions of homes. It will send many thousands of prospects to WESTINGHOUSE dealers.

This *national* drive will be supplemented by a *"Completely Balanced"* local merchandising tie-up that will get business everywhere.

Only the thin upper crust of the vast market for electric refrigerators has been touched. In your own local market nine-tenths of the homes, whether in apartments or residences, are preserving foods the old-fashioned way. Hundreds of families are ready to buy from the dealer who can prove that electric refrigeration is not an expense but an economy. *And* WESTINGHOUSE *dealers are doing that every day.*



MODEL WL45 (*Capacity 4¼ cubic feet*)
—for apartments and small homes

$180 f. o. b. factory

Steel sub-base 1¾ inches high, optional. Furnished with vegetable or dry storage drawer bin base, 9½ inches high, at slight extra cost. Can be built in with kitchen cabinets. Retail price only $180 f. o. b. factory.

A complete line of sizes in custom-styled cabinets, from 4¼ to 17 cubic feet capacity. A size for every home and apartment.

Your market—your future

WESTINGHOUSE, through powerful National Advertising and local sales stimulation, will bring this rich local market to your feet. Because WESTINGHOUSE makes it easy for the dealer to *prove* that any family can save $50 to $150 and more each year with this *"Completely Balanced"* automatic electric refrigerator, according to the size of family and the model used.

Dealership applications now being received Get details at once

If you are interested in the profits to be made in this great, modern market with the prestige of the great WESTINGHOUSE organization behind you and with a complete line of electric refrigerators retailing from $180 up, mail the coupon or wire us at once for complete details of the WESTINGHOUSE proposition to dealers.

The high peak of retail sales is just ahead. Don't delay. Make your inquiry *at once.*

WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY
Refrigeration Department · Mansfield, Ohio

Tune in the WESTINGHOUSE *Program every Sunday at 7 P. M., Eastern Standard Time, over* KDKA, KYW, WBZ, *and other stations associated with the National Broadcasting Company.*

Westinghouse

REFRIGERATOR

The name "WESTINGHOUSE" is your guarantee

MAIL THE COUPON FOR DETAILS

WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY
Refrigeration Department,
Mansfield, Ohio

Please send me details of the WESTINGHOUSE Refrigerator Franchise.

Name _____

Address _____

Cole Starts Expansion Program; Increases Advertising Budget

New York City—Addition of 149,562 sq. ft. of space in properties in Manhattan, Long Island City, Flushing, New Rochelle and Norwalk, Conn., to the holdings of Rex Cole, Inc., distributor of General Electric refrigerators, was announced Feb. 24, when the corporation officially closed lease deals involving aggregate rentals of $1,189,000.

This transaction adds key locations to the Rex Cole distribution system, which already included thirteen branch offices and showrooms and one hundred other sales outlets in Greater New York, Westchester, Rockland, Orange, Putnam, Nassau and Suffolk Counties, N. Y., and Fairfield County, Conn.

The largest single lease added the two-story warehouse at 193 Hunters Point Ave., Long Island City. This covers a total of 115,000 sq. ft. Terms called for a fifteen-year lease.

The entire third floor of the Rex Cole Building at Fourth Ave. and 21st St., Manhattan, with a total of 9,200 sq. ft., was leased for ten years. The administration, operating and sales promotion departments of the Rex Cole organization will be quartered in this space, with all executive offices fronting on the avenue.

With the new space on the third floor, Rex Cole now holds 33,200 sq. ft. of space in the building which bears his name, already occupying the basement, the ground floor, showroom and the entire second floor.

Showrooms, warehouse, garage and office space at 686 West Ave., Norwalk, Conn., totaling 20,298 sq. ft., were leased for a period of ten years.

In the new 14-story office building at 1 North Ave., cornèr of Huguenot St., New Rochelle, 2,664 sq. ft. of space were taken.

The other property, corner showroom and office space in Flushing, at 137 Northern Blvd., with 2,400 sq. ft. of space, was acquired for a period of ten years.

CONNECTICUT DISTRIBUTOR APPOINTED BY MAJESTIC

Hartford, Conn.—Stern & Co., Inc., 210 Chapel St., has been named western New England distributor for Majestic electric refrigerators and radios.

Stern & Co. was organized about 10 years ago. Starting as a retail establishment, the company broadened its policy to include wholesale distribution.

Previously this company was distributor for Grigsby-Grunow, having discontinued distribution in 1929.

Francis E. Stern heads the company. Branches are located in Boston, 285 Columbia Ave., and 335 Forest Ave., Portland, Me., where distribution is conducted through a subsidiary, known as Stern & Co., Inc., of Maine.

The territory includes all of Vermont, Berkshire, Hampton, Hampshire and Franklin counties in Massachusetts, and the entire state of Connecticut excepting Fairfield County.

New York City—An increase of approximately one hundred per cent in advertising space for 1931 in New York's metropolitan daily newspapers over the preceding year, and more than three hundred per cent over the 1929 schedule, has been announced by Rex Cole, Inc., distributor of General Electric refrigerators.

The plan calls for the placing of more than 400,000 lines in the local press alone.

At the same time plans have been outlined for enlarging the Rex Cole sales and office staffs by at least fifty per cent, and a fifty per cent voluntary increase in the 1931 sales quota.

This means, according to Mr. Cole, that more than 500 men and women will soon be added to the present staff of slightly more than 1,000. They will be given employment in Greater New York, Nassau, Suffolk, Westchester, Rockland, Orange and Putnam counties, in New York State, and in Fairfield County, Conn.

"During 1929 we placed 98,000 lines of space in the metropolitan dailies, and with the record of 1929 to support our confidence, we placed 211,000 lines of advertising in the same media in 1930. The result was that 1930 business showed a 76.2 per cent increase over 1929.

"We are further demonstrating our confidence by planning an increase of branch offices, of which we now have thirteen, and of distribution centers, of which we now have 100, located in Manhattan, Brooklyn, The Bronx, Queens, Staten Island, Westchester and other parts of our territory.

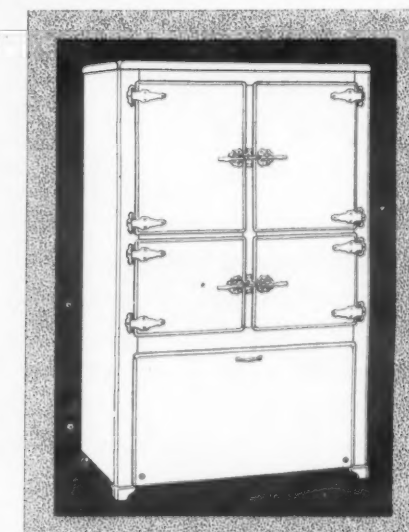
"We give advertising a large part of the credit for promoting with the public a greater refrigeration consciousness. In 1927 the majority of our buyers were homes with incomes of $10,000 and up. Now, the bulk of the market is composed of families earning $50.00 a week and more.

"The fact that this group is coming to a wider realization of the necessity of food preservation, and that payment terms are adjusted to fit their needs, will greatly assist in our anticipated growth and will also make the newspaper advertising program more productive. This whole demonstration is convincing proof that the electric refrigerator is no longer considered a luxury."

Founded in March, 1927, with a staff of four, in four years the Rex Cole organization has grown past the thousand mark. Mr. Cole pointed out yesterday, praising advertising as the "backbone of sales promotion."

GILL MANAGES BRANCH

Providence, R. I.—Paul Gill, formerly engaged in the real estate business in Cleveland, has become manager of the Providence office of Gentsch & Thompson Co., Inc., distributors for the General Electric refrigerators.



Rex Cabinets... quality built... for every requirement in a range of sizes from 4 to 15 cubic feet. There is a Rex Cabinet for every job... Write! *REX offers special assistance to unit manufacturers in developing new lines.*

Rex

Rex Manufacturing Co. Inc.
Connersville, Indiana

Boston Co. Plans Convention

Boston—More than 400 Copeland dealers in Maine, New Hampshire, Vermont, Rhode Island and eastern Massachusetts territory will get together here March 16 and 17 at the Hotel Somerset.

The meeting is under the sponsorship of the Appliance Engineering Co. of Boston, Copeland distributor in the above-mentioned territory.

E. A. Terhune

Mr. E. A. Terhune, president and general manager of the Appliance Engineering Co, has arranged a very attractive program for the Copeland dealers, which will be topped off by a banquet with entertainment furnished by a troupe of vaudeville artists.

The following officials of the Copeland factory are making a special trip to Boston to attend the meeting: Louis Ruthenberg, president; W. D. McElhinny, vice-president in charge of sales; Carlton Smith, secretary and treasurer; and E. H. Brown, vice-president.

FRIGIDAIRE ANNOUNCES CHANGE IN OMAHA SETUP

Omaha—More than 250 dealers and salesmen of the Frigidaire Sales Corp. were called to this city, March 2, for the spring meeting, which was held in Hotel Fontenelle, with L. J. Strain presiding.

S. R. Prugh, of Dayton; H. H. Schnabel, in charge of promotional work for the western region; L. J. Strain, Omaha zone manager; P. K. Abry, regional manager; L. S. Cooper, regional service manager; and E. V. Morava, zone comptroller for Frigidaire, addressed the convention.

The principal address of the meeting was given by John E. Curtiss, former chairman of the Nebraska State Railway Commission, but now with the Iowa-Nebraska Light & Power Co., immediately following the banquet in the hotel.

During the convention L. J. Strain made an announcement directly affecting the policy of Frigidaire retail sales in Omaha. The Omaha branch will no longer sell at retail. The General Radio & Refrigeration Co., 1811 Farnam St., has taken the retail agency. The retail company is headed by Fred H. Kaup, for several years handling Maytag products in Wayne, Neb. J. W. Knodel is vice-president and manager. This company opened for business March 2 and has 16 salesmen employed.

L. J. Strain will continue in charge of the Omaha zone, which includes all of Nebraska and western Iowa.

ELECTROLUX SHOWS NEW MODELS TO UTILITY MEN

Chicago—Three hundred and eighty-five sales managers and executives of the gas industry were given the opportunity of inspecting several of the new 1931 models of Electrolux gas refrigerators during the recent Fifth Midwest Gas Sales Conference held at the Sherman Hotel.

Electrolux Refrigerator Sales, Inc., occupied a suite adjoining the auditorium in which were displayed several domestic models of gas refrigerators.

These included the Brooklynite model EA-3A, Kitchenette model EA-4, and the Hostess model EA-5B.

Members of the Electrolux Refrigerator Sales, Inc., attending the convention and contacting gas company members were: F. E. Sellman, vice-president in charge of distribution; George L. Roach, assistant sales manager; C. A. Miller, Chicago zone supervisor, and H. L Stearns, F. P. Shea, R. R. Guenther, J. W. Crashley and Glenn Kriekhaus, district and sales engineers.

Training Salesmen for the Field of Commercial Refrigeration

By George R. Lindahl
General Sales Manager, Commercial Refrigerator Mfg. Co., Ltd.

TURNOVER of salesmen, repossessions and service due to improper selling, can be greatly reduced in the commercial refrigeration field by proper selection and training of salesmen. Cost of selling, which has run in the neighborhood of 25 per cent, can also be lowered to about 15 per cent.

From a close study of repossession figures, the writer believes that at least 80 per cent of all repossessions could be avoided if the salesman knew all angles of his profession.

Oversold jobs, undersold jobs, selling to people who cannot meet payments, and making statements that are not consistent with actual performance, all have a bearing on delinquent payments, repossessions and cost of service. These costs which are brought about by untrained salesmen, add greatly to the selling expense.

In the specialty fields, similar to the refrigerator case field, the commissions paid run from 10 to 20 per cent, with an average of about 15 per cent. As it is necessary to put the salesman on a drawing account until he lines up his prospects and gets under way, the cost of selling will run considerably over this figure.

If drawing accounts are not paid, it will be necessary to employ only salesmen who have sufficient funds to tide themselves over until they get into production.

Difficulties encountered in operating a straight commission sales force, particularly in this field during the last 10 years, caused the writer to work out a method of selecting and training salesmen that has succeeded in keeping total sales expense down below 15 per cent, and reduced service and repossessions to the minimum.

During 1929, which was a fair year, 84 per cent of all salesmen we selected and trained made good, while during 1930, which was considered quite a poor year, 56 per cent of all men trained made good.

How Salesmen Are Selected

Proper selling of commercial refrigeration requires considerable knowledge of merchandising and refrigeration, and we select our salesmen from the following fields:

Mechanical engineers who have had sales experience.

Men who have had refrigeration sales and service experience.

Men who have sold high grade specialties to retail stores.

We have made it a practice not to employ men who have spent their time selling commodities, such as foods, clothing, automobiles, as only about 10 per cent of the commodity salesmen succeed in specialty selling. Real estate, stock and bond and insurance salesmen also very rarely succeed in this business.

The best ages for commercial refrigeration work seems to be between 28 and 45. The percentage of failures of men, over or under these ages, is out of proportion to those who succeed.

The type selected are men who have initiative, who are fairly quick thinkers, and who have had sufficient experience in the field so that they are not easily downheartened.

Methods of Remuneration

The training period usually requires about two months. During this time each man is guaranteed a flat sum of $100 per month. The commission paid amounts to 10 per cent on the net amount of the sale after deducting trade-ins and carrying charges, which is payable after 20 per cent or more of the cash value is paid in. This 10 per cent is charged back against their drawing account of $100.

Each salesman is required to make at least one sale before the end of the first 30 days. If he fails, he is placed on the straight commission file and kept there until he makes his first sale.

As the salesman knows this when he starts, he uses every effort to close at least one sale during the first month, so that he can remain on the drawing account. If he succeeds in closing two sales during the first month, he has his drawing account raised to $150.00 the following month. If he falls down to one sale the following month, he automatically drops back to the $100 basis. By using the fluctuating drawing account, every man fights to keep his higher drawing account.

The last class put through in January consisted of five men. Refrigeration sales in January are, as a rule, considerably under normal, but out of the five men who started training January 1, three made sales.

The sales for these three men totaled seven units at an average cash selling price of $950, including the compressors. This showed a gross value of $5,700. At 10 per cent the commissions due and payable were $570, divided as follows: Salesman No. 1, $285; No. 2, $190; and No. 3, $95. Over and above the $500 guaranteed during the training course, the total sales expense for the month for these five men was $770, or an average sales expense per man of $154.

Assuming that the average gross profit amount to 40 per cent on the selling price, or $2,280, and deducting the sales costs (which included the training period) of $770, the profit amounted to $1,510, as the results of the first month's work of these five new, untrained men. Of course, general overhead, etc., must be deducted to secure the actual "net."

Out of the group of five, three salesmen earned enough to cover their drawing account and two salesmen failed to make a sale. However, out of the latter two, one was a complete failure and the other made several contacts that resulted in two sales the first week in February. In this particular class we were very successful during the first forty days of training.

Assigning Territories

The territory to be offered to the new salesmen is laid out on a chart. Types and number of stores, nationality of population in each trading zone, and buying habits are considered. Each salesman is asked to state his preference as to the class and nationality of trade that he prefers to work. In this way we usually get each man in the territory that is best suited to his likes and temperament.

Each salesman is "sold" on our method of working the territory. First, determining the need for the equipment. Second, finding the right man to talk to. Third, the proper approaches. Fourth, demonstration that proves the profit story, and finally book of users as additional proof, the sum up and close.

The Training Course

The training school is held between 4:00 p. m. and 6:00 p. m., five days a week, with a general sales meeting each Saturday morning between 10:00 and 1:00 o'clock. During the day each man is out in his territory putting over the story he learned the day before. He gets in this way as much education in the field as he does in class. The training course is split up into two sections.

The first section—The first 30 minutes are devoted to explaining conditions and alibis that were encountered during the day's work. The next 30 minutes are devoted to a course in sales psychology, character analysis, approaches and closings.

The second section—Blackboard talks take up the principles of refrigeration for all makes of machines, cabinets, etc. Elementary chemistry, elementary physics and science, air conditioning and vapor pressures are also considered.

General merchandising conditions, profits, losses and overhead, and how to prevent losses and increase sales are also touched upon. Operations of privately owned chains, meat packers and other wholesalers and large retailers of perishable foods are studied. Efficient store layouts, advertising, display merchandising, etc., are discussed, with a general outline how commercial refrigeration fits into the whole picture, to the advantage of the merchant from every conceivable angle.

At the close of each class the salesmen are given a list of examination questions, covering the subjects discussed in class. Each man is required to submit written answers after he reaches home that night. The answers received give a very good indication on how the salesman is assimilating the material given him in the blackboard sketches and talks.

Salesmen "Blossom Out"

It is surprising how the average specialty salesman will "blossom out" at the end of the first 30 days. Men who knew practically nothing about perishable food merchandising or refrigeration, can talk like experts, and as they have the foundation, they usually talk correctly and convincingly.

It is also a peculiar thing that men who succeed during the first thirty days usually are consistent producers afterwards. The entire keynote of the training course is, 1st: Sell yourself on the company, the management and the product. 2nd: Secure the knowledge so you can talk correctly, intelligently and enthusiastically. 3rd: Work your territory consistently and do not high spot and work for the one-call sale. 4th: Be absolutely honest with yourself, your prospect and your company. 5th: Forget that eight hours make a work day. Talk to your prospects whenever they will listen.

HANDLING MAJESTICS

Cleveland—Liberty Electric Co., East 105th St. and Superior Ave., has recently signed a franchise to sell Majestic refrigerators.

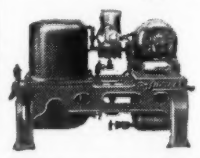
Juruick REFRIGERATION

Back of the Juruick franchise is a reputation that helps to sell Juruick machines. Juruick serves every industry that uses refrigeration. The reliability and efficiency of Juruick machines have been demonstrated in hundreds of installations in this country and abroad.

Added to the reputation of the machines themselves is the prestige of the company that makes them. Product of an engineering and manufacturing organization that has been building fine machinery for more than seventy years, they embody all the good features that result from wide experience in machine design and ample manufacturing facilities.

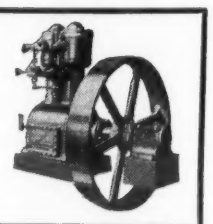
Juruick offers a complete line of self-contained automatic units, compressors up to 40 tons capacity, fittings, accessories and low sides. It provides units with capacities to meet the new lower temperature requirements. To the dealer who is now handling household mechanical refrigerating machines or small commercial sizes, Juruick offers the opportunity to extend his activities to cover the profitable field of commercial refrigeration.

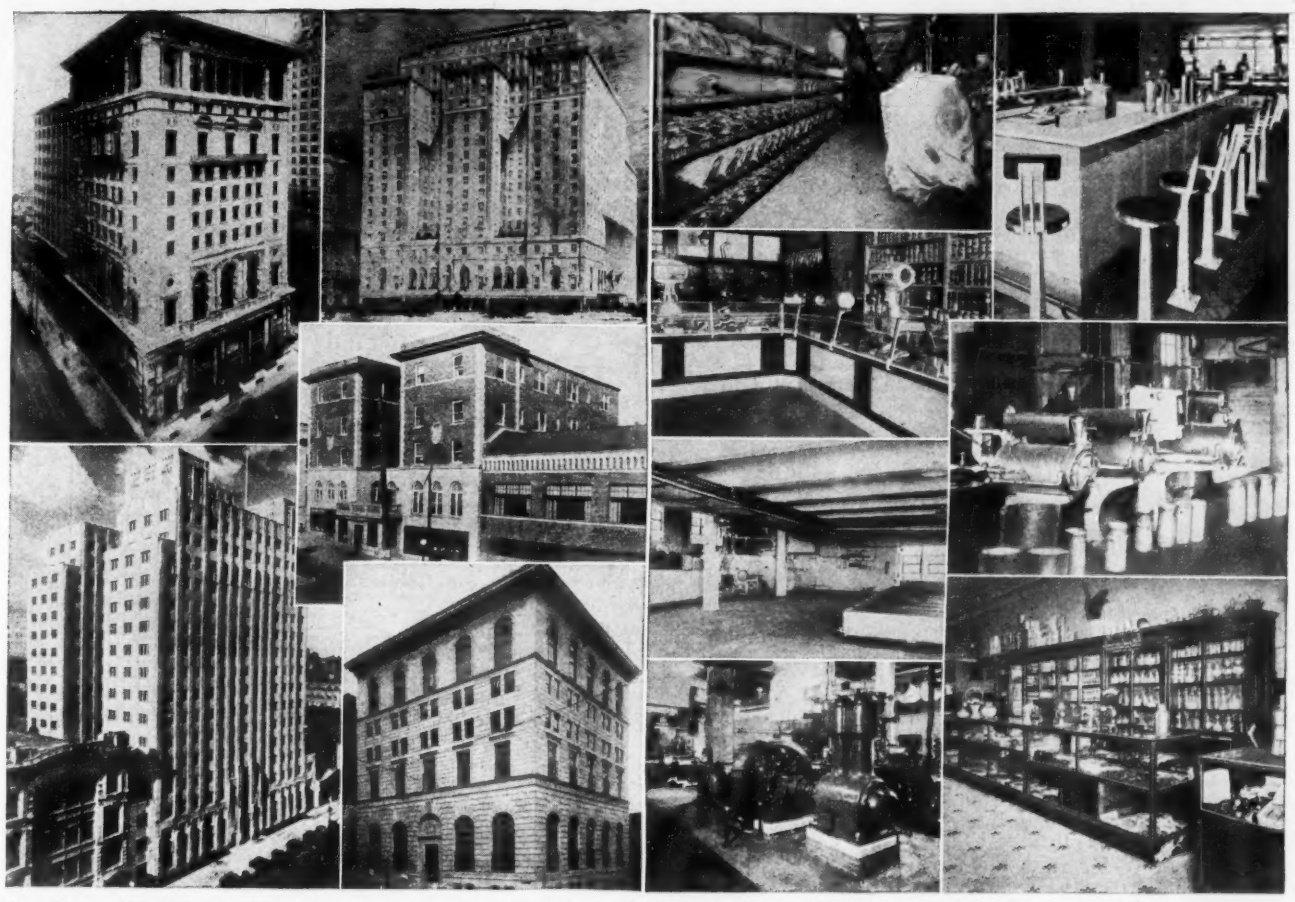
¼-Ton to 40-Tons



7 Self-Contained Units

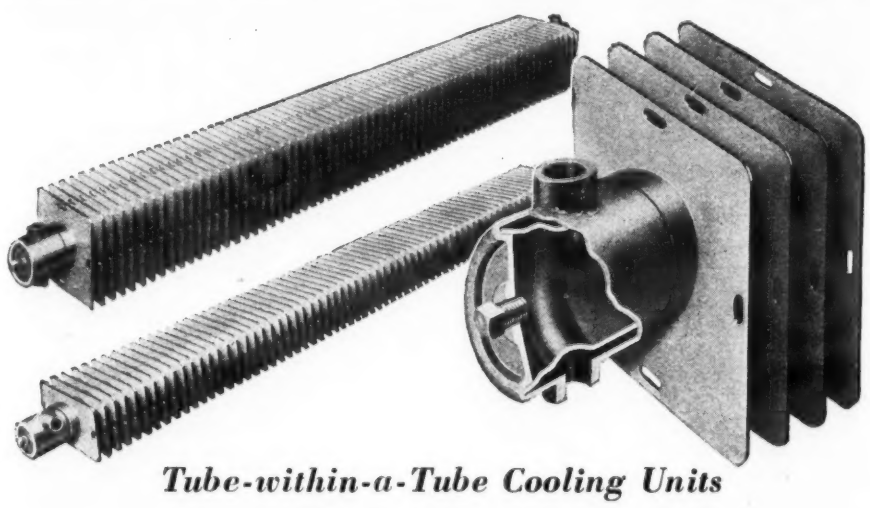
15 Compressors





The group of buildings above illustrates the widespread demand for refrigeration in club, hotel, hospital and office building. The other pictures show installations in a wholesale meat establishment, soda fountain, bakery, ice cream plant, dairy and confectionery store. The buildings are: Upper left, Manufacturers' Club, Philadelphia, Pa.; at the right of it is the Hotel Roosevelt, New York; center, Hotel Arms, Cincinnati, Ohio; lower left, Hahneman Hospital, Philadelphia; at right of it is the Federal Reserve Bank Building, Baltimore, Md. All use Juruick Refrigeration.

HYDRO-THERMAL GRIDS



Tube-within-a-Tube Cooling Units

Tube-within-a-Tube Multiple Cooling Units for Maximum Heat Absorption and Rapid Heat Dissipation in Minimum Space

24 ADVANTAGES

1. *An entirely new development in modern refrigerating equipment.*
2. *Advantages of the "Finned Coil" and "Sectional Coil" combined in one.*
3. *Completely standardized.*
4. *Designed for "over-the-counter" delivery and easy assembly.*
5. *Flexible for assembly into any size or shape "low side" cooling unit.*
6. *Maximum number of "low side" assembly combinations from minimum stock numbers.*
7. *Dispenses with special engineering and special manufacturing for each "low side" requirement.*
8. *Any part of assembled "low side" may be replaced without loss or damage to remainder of assembly.*
9. *Greatest heat-absorbing capacity in minimum bunker space.*
10. *Brine hold-over when desired at no extra cost.*
11. *Releases bunker space for greater storage space.*
12. *Permits free circulation of air.*
13. *Defrosts each cycle for fresh food temperature requirements.*
14. *Moisture evaporates from coils back into the air.*
15. *Minimum dehydration of foods.*
16. *Clean surface reduces operating cost.*
17. *Full flooded or dry gas system.*
18. *Reduces amount of refrigerant required.*
19. *Shortest travel of heat-laden expanded gas.*
20. *Made from best grade seamless steel tubing and steel grids.*
21. *Volume production with special machines, tools and dies.*
22. *Fins fitted to tubes with 40-ton automatic hydraulic machine, insuring perfect bond for rapid heat transfer.*
23. *All grids heavily galvanized and rust-proof.*
24. *Lowest price for equal heat absorbing capacity.*

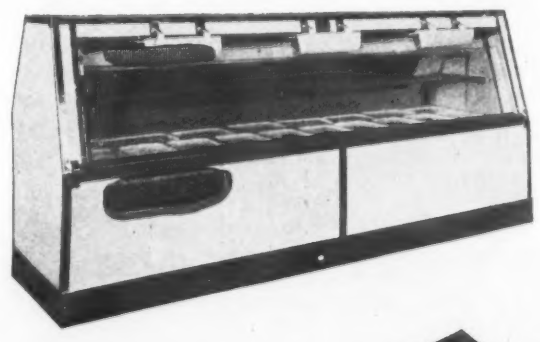
Hydro-Thermal Grids provide mechanical refrigeration that preserves all the natural moisture of meats and other foods and retains their full weight without loss from dehydration. Almost over night, this amazing new invention has introduced new standards in mechanical refrigeration and has completely changed methods of selling refrigerating equipment.

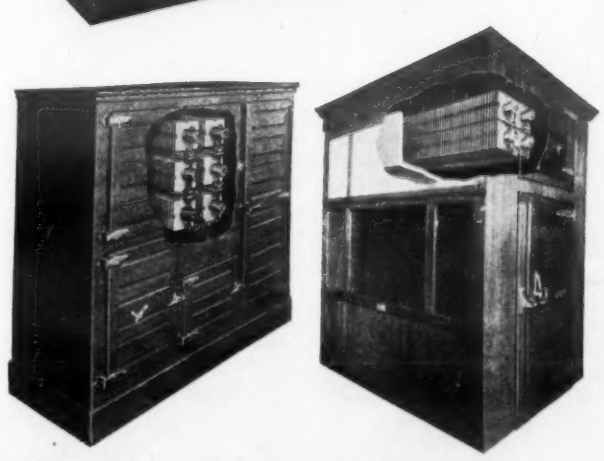
Hydro-Thermal Grids enable the dealer to sell and install any size and shape of low side unit without special engineering. From a comparatively small stock of standard units low sides can be readily assembled to meet any commercial requirement. These new grids make the selling of low sides practically an "over-the-counter" proposition.

For the user, Hydro-Thermal Grids offer a refrigerating system that accumulates no frost. They not only provide maximum heat-absorbing surface in the fins, but by their tube-within-a-tube construction they spread out the refrigerant in a thin layer in contact with the large surface of the outer tube. The heat-laden gas travels only the length of a single grid instead of following the windings of a bent pipe coil. It fairly flashes through these units. This combination of the tube-within-a-tube construction and short gas travel gives almost unbelievable refrigerating capacity.

Hydro-Thermal Grids and Juruick Refrigerating machines are an unbeatable combination for dealer and user alike. Some good territories are still available.

GRID APPLICATIONS





Hydro-Thermal Grids are applicable to refrigerators, coolers, room cooling, display cases, frozen food cabinets, refrigerated show windows, etc., etc., with any ammonia or methyl chloride system of mechanical refrigeration.

AMERICAN ENGINEERING

AMERICAN ENGINEERING COMPANY, 2420 ARAMINGO AVENUE, PHILADELPHIA

EXPORT INFORMATION ON NEWFOUNDLAND

British Dominion Unexplored Territory for Refrigerators

By Edward A. Dow

American Consul General, St. John's, Newfoundland

THE demand for household electrical appliances in Newfoundland depends primarily upon the cost of the article itself.

In the case of refrigerators, however, the demand is relatively small, due to the prevailing cool weather, the average summer temperature being 65 degrees, and the small number of houses which are wired for power current.

The winters are long and cold, and even during July and August, the two warmest months, it is often thought unnecessary to keep foodstuffs on ice.

Perishable foods are purchased in small quantities as they are required during the warmer periods of the summer.

Most of even the best class of houses have the ordinary ice box cabinet type of refrigerators, which occupants consider ample for their requirements. They regard the hot summer days as too few to justify the purchase of the more expensive electric refrigerator.

There are no companies engaged in the manufacture of ice for sale. A sufficient quantity for domestic use during the short summer is taken from the numerous ponds and lakes scattered throughout the island during the winter months.

This supply is stored, usually in sawdust, and delivered to customers, especially in the city of St. Johns, each morning during the warm season of the year.

A real market is not predicted in this colony for electric refrigerators, attributed to the facts already mentioned, as well as the unfavorable economic conditions prevailing in Newfoundland as in other parts of the world.

Electric Refrigerators in Operation

Three of the best-known American refrigerators are represented in this market. One of the agents states that not more than 20 electric refrigerators altogether are now in use in St. John's, including those used by retail grocers, as well as for domestic purposes. No other makes are sold in Newfoundland.

Local Freezing Facilities

There are five large cold storage plants in the colony, all of which are of the rapid-brine-freezing variety.

Three of these are in St. John's and are owned, respectively, by Job Brothers and Co., Ltd., Harvey and Co., Ltd., and one by the Newfoundland government.

A large cold storage plant at Port Union is owned by the Fishermen's Protective Union of that town. Another plant at Lomond is owned by the Hudson Bay Co.

In addition, Job Brothers and Co., Ltd., own and operate a large floating cold storage plant, the *Blue Peter*, while Harvey & Co., Ltd., own and operate the *Sunset Glow*.

These vessels collect fresh fish, especially salmon, during the season and bring it in a frozen condition to St. John's, where it is transferred to refrigerated steamers bound for the United States and Canada.

Electric Current

Two power companies supply electric current on the Avalon Peninsula.

The Newfoundland Light & Power Co. at St. John's, sells current to approximately 7,000 customers in and about St. John's.

The United Towns Electric Co. of St. John's, which supplies power to the former concern, also serves with light and power the principal outport towns of Conception and Placentia Bays.

Both of these companies maintain retail stores and import electrical supplies, which are offered for sale in St. John's and the smaller towns.

At Corner Brook, the International Power Co. of Newfoundland, Ltd., operates a large paper mill and produces its own electric current for the operation of the mill and sale to customers.

Both the towns of Grand Falls, owned by the Anglo-Newfoundland Development Co., Ltd., and Buchans, a mining townsite where a mine is operated by American interests, are provided with electric current by these concerns for their employees and other residents.

The Royal Stores, Ltd., of St. John's, enjoys an exclusive franchise for the sale of electrical supplies in these two towns.

All electric current supplied in Newfoundland is alternating, three phases, sixty cycles, 110 voltage.

Credit reports can be had from American banks specializing in foreign business, or from the commercial reporting agencies of Dun or Bradstreet, both of which have representatives at St. John's.

Prices and Stocks

One representative here—the Newfoundland Light & Power Co., Ltd.—finds that a medium-sized model for domestic purposes, which sells for $450, meets the approval of customers interested in electric refrigeration. They have sold no other type.

This firm never carries in stock more than one electric refrigerator at any one time, and at present has none on hand.

Large posters and other advertising material are displayed in the showroom of this concern, which carries electrical appliances of all varieties that meet the requirements of the population of St. John's and the small towns of the Avalon Peninsula, all within a radius of 80 miles of the city.

Another representative of an American electric refrigerator manufacturer—Bowring Brothers, Ltd., of St. John's—has given the Consulate General the following schedule of retail selling prices:

	4 Cu. Ft.	5 Cu. Ft.	6 Cu. Ft.
All White Porcelain	$280	$335	$375
All Gray Porcelain	250	270	

Bowring Brothers, Ltd., carry in stock one model of each of the sizes mentioned in the price schedule above. This firm is a department store which does a general wholesale and retail business.

Economic Conditions

Fishing is the principal means of livelihood in Newfoundland, and more than half of the population is engaged in some branch of the fishing industry.

With the exception of a few relatively well-to-do persons living in St. John's, the capital and only city, the standard of living is low, poverty is widespread, and while the fishermen's ability to purchase foodstuffs, clothing, etc., varies considerably from year to year, depending upon the season's catch of fish, they are able to buy little more than the necessities of life.

Duty

Item 191 of the Newfoundland Customs Tariff imposes a duty of 45 per cent on electrically-driven appliances, such as refrigerators, vacuum cleaners, washing machines, etc., when costing at the point of shipment over $100; when costing less than $100 at the point of shipment, the duty collected is 50 per cent ad valorem.

Electrical Appliances Imported

The Newfoundland Customs department does not list specifically electrical appliances imported according to commodity, but the following table shows the value of such equipment as stated in the Customs Returns for the latest fiscal year available, ended June 30, 1929:

Electrical Appliances Imported into Newfoundland for the Fiscal Year Ended June 30, 1929

Article	Country from which Imported	Value
Electrically driven appliances costing up to $100	United Kingdom	$ 107
	Canada	3,923
	United States	4,942
		$8,972
Electrically driven appliances costing over $100 (including refrifierators)	Canada	$2,532
	United States	4,347
		$6,879
For cooking and heating, costing $50 or less	United Kingdom	$ 679
	Canada	1,627
	United States	6,009
		$8,315
For cooking and heating, costing over $50	Canada	$4,132
	United States	1,866
		$5,998

Newfoundland a Separate Dominion From Canada

Newfoundland is not a part of Canada—it is a separate Dominion. Importers prefer to deal direct with American manufacturers, rather than through their branches or agents in Canada, and in many cases insist on dealing direct, so as to eliminate all intermediate commissions and profits.

No preferential tariffs are in effect in Newfoundland on refrigerators, and imports from the United States are not assessed at a higher rate than those originating in Canada or in the British Isles.

Credit Terms

Quotations in United States currency are satisfactory to Newfoundland importers on the basis of c. i. f. St. John's and f. o. b. New York or Boston.

The prevailing terms are cash against documents, although in some cases sixty days' time is allowed on certain classes of merchandise. Local credit terms are long, usually extending over a year.

Preparation of Invoices Covering Shipments to Newfoundland

Invoices covering shipments from foreign countries to Newfoundland must be prepared in accordance with the form prescribed by the Newfoundland Customs, and the correctness thereof certified thereto by the shipper.

This form is identical with that used for Canada, and may be obtained from almost any customs broker in the United States, or direct application to the Minister of Customs at St. John's, Newfoundland.

Mailing of Catalogues to Newfoundland Importers

American exporters should be careful to meet requirements for the sending of catalogues or other printed advertising material to Newfoundland.

Such catalogues or other printed material one pound or more in weight are delivered to addresses in Newfoundland only upon payment by the recipient of a duty at the rate of 15 cents per pound.

In the case, however, of packages of one pound or less, American exporters should, after having affixed the full amount of American postage, attach also to the package Newfoundland, and not Canadian, customs revenue stamps at the rate of 1 cent per ounce on each package.

These customs revenue stamps may be obtained from the Minister of Finance and Customs at St. John's, or from the Superintendent of the Newfoundland Post Office at North Sydney, Nova, Scotia, Canada.

The superintendent of this latter office has no connection with the Government of Canada, and is authorized to forward packages mailed to the United States for Newfoundland only when such packages have the required amount of Newfoundland customs revenue stamps affixed thereto.

The superintendent of the Newfoundland Post Office at North Sydney states that he is constantly receiving small packages without revenue stamps, and is therefore required to withhold them from delivery until the necessary stamps or remittance therefor have been received by him.

Letter postage to Newfoundland is 2 cents an ounce or fraction thereof. Following are names of firms interested in electric refrigeration. These names have been furnished by the American Consul General at St. John's, Newfoundland American consular officers at any foreign city will furnish names directly to any American firm or individual addressing them.

Bowring Brothers, Ltd., Water St. Established 1811. Employees, 200. Capital, $1,000,000. Annual turnover, $3,500,000. Handles one of the three makes of refrigerators referred to in accompanying letter.

Newfoundland Light and Power Co., Ltd, Water St. Established 1924. Employees, 200. Capital, $175,000. Annual turnover, $300,000. Represents well known electric refrigerator manufacturer.

Brookfield Ice Cream Co., Lemarchant Road. Holds third agency.

Royal Stores, Ltd., Water St. Established 1895. Employees, 660. Capital, $400,000. Annual turnover, $2,000,000. Department store; has branches at Buchans and Grand Falls.

United Towns Electric Co., Ltd., Telephone Bldg., Duckworth St. Established 1904. Employees, 36. Capital, $1,000,000.

General Information Regarding the American Consular District of St. John's, Newfoundland

Area and Population

The Consular district of St. John's includes the Dominion of Newfoundland. The area of the island is 42,000 square miles (as large as New York) and the Atlantic watershed territory in the Labrador owned by Newfoundland is estimated at 110,000 square miles. Only 186 square miles of the island are occupied, and not more than 50 per cent of this area is improved. According to the 1921 census, the figures of which appear substantially correct in June, 1930, the total population of the district was 263,033, the island containing 259,259 inhabitants and Labrador 3,774. The settlements, except the mining town of Buchans and the paper mills at Grand Falls, are all on the coast. St. John's, the capital and only municipality, also the principal commercial center and port, has a population of about 35,000; other towns have the following populations: Corner Brook, 6,000; Grand Falls, 5,000, and Harbor Grace, 4,300. Over 98 per cent of the population is native born, descended from Irish, English and Scotch settlers. Approximately one-sixth of the population is illiterate. About one-fourth derives its chief livelihood from catching and curing codfish. The standard of living is low, compared with that of the United States and Canada.

Topography and Climate

The bold coast line of Newfoundland has an extent of over 6,000 miles, and it is indented with numerous deep bays and harbors. The land near the coast is rugged, and the interior, which is wild and rocky, is an elevated, undulating plateau traversed by low mountains. Rivers and lakes are numerous. There are forest, mineral and arable lands. The Newfoundland winter is cold and prolonged, with heavy snowfall; spring is late and uncertain; summer is short and cool, but autumn is often mild and extends into December. High winds and fog are prevalent in Newfoundland waters throughout the year. At St. John's the thermometer ranges from 10° F. to 80° F., although the extremes are much greater to the north and west. The Arctic current affects markedly the climate of the east coast. It is suggested that visits to Newfoundland for commercial purposes be made between May and December.

Form of Government

The Colony of Newfoundland, which is a self-governing Dominion, is the oldest of the British possessions. It is administered by a responsible Prime Minister, assisted by an Executive Council (cabinet) not exceeding ten members. The legislative branches are a House of Assembly (lower house), consisting of 40 representatives elected for four years, and a Legislative Council (upper House), consisting of 24 members, appointed for life. There are eight Ministerial Departments, and a Railway Commission headed by the Prime Minister. A governor, appointed by the Colonial Office at London, represents the Crown.

Customs Tariff

The tariff, created largely for revenue, is high—averaging 50 per cent ad valorem duty on importations of manufactured products and foodstuffs. In addition to the regular import duties, a sales tax of five per cent is levied on the invoice cost. A certificate of consignor stamped or written on the invoice as to correctness of quantity and value is required. A form of certificate will be furnished on application to the Deputy Minister of Customs, St. John's, Newfoundland.

Resources of the District

Fisheries, forests and mines: The fisheries of Newfoundland are among the most abundant in the world and extend along the entire 6,000 miles of coast line. The forest area is estimated at 10,000 square miles, chiefly in the northern and western districts. There is an abundance of black spruce, fir, and balsam, eminently suited for paper making. Hydro-electric and paper mill investments and developments in the colony now exceed $70,000,000. Official British reports credit the island with possessing one of the largest iron deposits of the world, as well as important deposits of coal, copper, lead, pyrites, and zinc. The iron deposits are being extensively worked, with an annual exportation of approximately 1,000,000 tons of hematite ore. Zinc and lead ores are also being mined. Cabbage, potatoes and hay are grown in small quantities, but fresh vegetables and fruits are imported, principally from Prince Edward Island, Canada and the United States.

Industries of the District

Newfoundland fisheries have been famous for centuries and still constitute the principal industry from the standpoint of the number of men employed, although the value of newsprint exports now exceeds that of the products of the fisheries. Engineering, foundry and ship repair facilities are in operation, including a 600-foot dry dock. Other industries of St. John's and the outports include clothing, paint and cordage factories, cod liver oil and seal oil extracting plants; bakeries, and factories making cigarettes and plug tobacco, butterine, aerated waters, tinware, nails, and knitted woolen goods.

Apart from the paper mills and mines, the industries of the colony are not being rapidly developed because of the limited domestic market.

Trade—Imports and Exports

The principal imports are foodstuffs, including flour, fresh vegetables, fruits, eggs, canned goods, pickled beef and pork, and molasses; coal, salt, petroleum products, cordage, live stock for butchering, leaf tobacco, hardware and dry goods.

The principal exports are newsprint, iron ore, salt fish, fish and seal oils, furs, berries, hair seal skins, limestone and gypsum.

Imports and exports for the fiscal year ended June 30, 1930, increased from the totals stated above to $31,871,151 and $40,051,959, respectively.

Comparative Statement of Newfoundland Trade with the United States and Other Countries, Fiscal Year Ended June 30, 1929
(Latest Official Statistics)

	U. S. A.	Canada	Gt. Britain	Other Countries	Total Trade
Imports from*	$ 9,880,431	$11,832,415	$ 6,211,906	$ 1,312,629	$29,237,381
Exports to	11,596,643	3,046,802	7,578,190	14,576,068	36,797,703
	$21,477,074	$14,879,217	$13,790,096	$15,888,697	$66,035,084

*Indicates country from which goods were shipped rather than country of origin.

Transportation Facilities

St. John's has direct weekly passenger and freight connections with New York by steamers of the Furness-Red Cross Line, which call at Halifax both on the outward and inward journey.

Furness, Withy & Co. also provides a passenger and freight service every two and a half weeks, having two vessels plying regularly between Boston and Liverpool, stopping in each direction both at Halifax and St. John's.

A regular freight service is also maintained from St. John's to Prince Edward Island, North Sydney, and other points in Canada, including Montreal, during the open season from about May to November.

Ordinarily St. John's is an open port the year round.

A railway line across Newfoundland from St. John's to the southwest port of Port-aux-Basques provides passenger service three times a week, connecting at Port-aux-Basques with the overnight ferry service to North Sydney.

This route is used for all mail and parcel post between Newfoundland and Canada and the United States.

St. John's is approximately 550 miles from Halifax, about double that distance from New York, 1,020 miles from Montreal, and nearly 2,000 miles from Liverpool. American vessels do not call regularly or frequently at this port.

Banking Facilities

There are no branches of American banks in this district. The four local banks, all of which have branches in the outports, are: Bank of Montreal, Royal Bank of Canada, Canadian Bank of Commerce, and Bank of Nova Scotia. The Government conducts one institution, a savings bank.

GORSUCH, JENNINGS TAKE NEW POSITIONS

Alexandria, Va.—George W. Gorsuch, merchandise manager of the Virginia Public Service Co., was recently transferred to Charlottesville, Va., as central division merchandise manager.

He succeeds George Schrandt, Jr., who has entered the lighting division of the company.

Lawrence Jennings resigned from the Eastern Shore Public Service Co., of Salisbury, Md., to succeed Mr. Gorsuch as merchandise manager at Alexandria.

Villages, Towns Need Outlets, Statistics Disclose

UNEXPLORED territory lies in the villages and hamlets of the nation, believes A. A. Uhalt, of the General Electric refrigeration department. To substantiate his point, he presents statistics on the number of sales outlets through which G. E. refrigerators are sold in the United States. Whereas there are 308 dealers and 219 commercial displays in the 190 cities which have a population of more than 50,000, there are only 1,364 dealers and 11 commercial displays in the 114,832 towns and villages which have populations of less than 1,000. The statistics follow:

Population	Possibilities (Number of Cities)	Number of Outlets (Dealers)	Commercial Displays
Under 1,000	114,832	1,364	11
1,000 - 3,000	4,729	1,613	60
3,000 - 5,000	1,034	562	56
5,000 - 10,000	792	604	108
10,000 - 25,000	598	578	178
25,000 - 50,000	180	243	130
50,000 and over	190	308	219
Total	122,355	5,272	762

TRIO ORGANIZES COMPANY

Hartford, Conn.—The Kelvinator-Raff Corp., Hartford, Conn., which has been granted a state charter to deal in electric refrigerators, will also deal in plumbing and heating supplies and conduct a plumbing and heating contracting business. The incorporators are: F. J. Raff, 487 Cornwall St.; N. B. Francis, and A. W. Creedon, 50 State Street, all of Hartford.

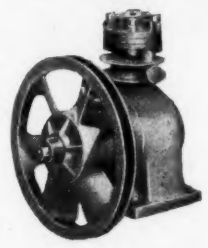
REPRESENTING MAJESTIC

Des Moines, Iowa—The Hieb Radio Supply Co., local distributor for the Majestic radio, has been named distributor for the Majestic refrigerator.

KULAIR Electrical Refrigerating Products

Simplicity, quality, efficiency and capacity unequaled. A size for every use.

Compressors from 95 Lbs. to 4300 Lbs. I. M. C.



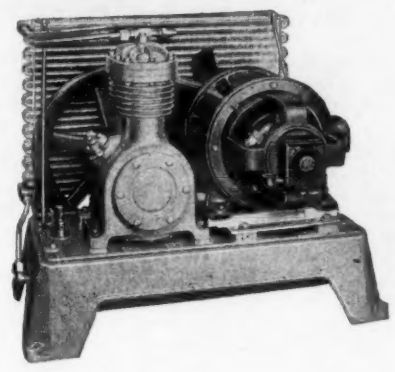
NO. 1300 COMPRESSOR
Single Cylinder 1⅝ x 1⅝
300 to 425 R. P. M.

Condensing Units from Small Domestic to Large Commercial Capacities.

AIR COOLED WATER COOLED
METHYL CHLORIDE or SULPHUR DIOXIDE

POLICIES
PRODUCTS
PRICES

Providing Proper Profit To All Distributors.
WRITE FOR FULL INFORMATION TO



KULAIR CORPORATION PHILADELPHIA, PA.

March Refrigeration Advertising

A survey of national magazines in the Detroit Public Library shows that the following electric refrigeration advertisements appeared in the February issues:

Better Homes & Gardens.
General Electric, full page in black and white.

Collier's, Feb. 14.
Frigidaire, 2-page spread in black and gold.

Fortune.
General Electric, full page in four colors.

Good Housekeeping.
General Electric, full page in four colors.
Kelvinator, full page in four colors.

House & Garden.
General Electric, full page in four colors.

Ladies' Home Journal.
Electrolux, full page in four colors.
General Electric, full page in four colors.
Kelvinator, full page in four colors.

McCall's.
General Electric, full page in four colors.

Saturday Evening Post, February 7.
Electrolux, full page in four colors.
Kelvinator, full page in four colors.
Westinghouse, 2-page spread in four colors.

Saturday Evening Post, February 14.
General Electric, 2-page spread in four colors.

Saturday Evening Post, February 21.
Frigidaire, 2-page spread in black and gold.
Servel, full page in four colors.

Saturday Evening Post, February 28.
General Electric, 2-page spread in four colors.
Leonard, 2-page spread in four colors.

Woman's Home Companion.
General Electric, full page in four colors.

CHICAGO ICE COMPANIES BRING SUIT AGAINST CITY

(Concluded from Page 1, Column 4)

believes, is to embarrass the electric refrigeration industry.

In the bill filed by the ice manufacturers, protest is lodged against the "dangerous gases" in single unit systems, against the fact that single units need not be tested or inspected, against the fact that the city does not require gas masks or conspicuously posted refrigerant labels to be furnished with household models, and against the fact that they must pay inspection fees, whereas owners of single units need not.

There are 60,000 single unit systems in Chicago, the bill states. These systems, under section 3680 of "said purported ordinance of December 11, 1930," are not inspected.

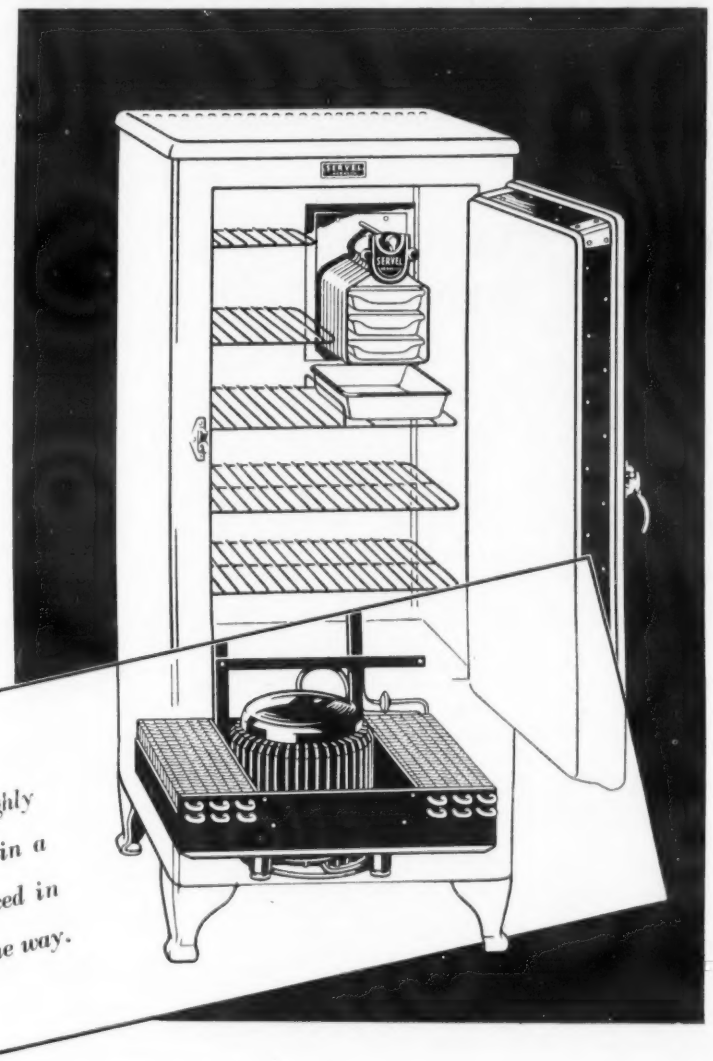
It is necessary only to approve the plans and specifications of manufacturers who, by paying $100, may obtain a general permit for a type or model. "There is no standard, guide, or basis" provided for this approval, the bill complains.

Simplified Refrigeration

HERE'S THE HEART OF THE

SERVEL

HERMETIC



This phantom view shows the highly simplified working unit, sealed in a permanent bath of oil and placed in the base of the cabinet, out of the way.

THE Self-Starter revolutionized the automobile business—and years later Four-wheel Brakes did it all over again. Imagine trying to sell an automobile today without these two basic requirements.

In the same way, the Servel Hermetic has completely revolutionized the electric refrigeration industry. This highly simplified refrigerator embodies not merely one outstanding improvement over yesterday's electric refrigerators, but a whole series of them—and sets a new standard of performance for years to come.

Eventually you will undoubtedly find other electric refrigerators built along the same advanced engineering principles as the Servel Hermetic. But today there is only one! And the dealers and distributors who handle the Servel Hermetic have profit opportunities never possible before.

The working unit is the simplest ever produced, with fewer moving parts than others—hermetically sealed under 10 tons pressure in a permanent bath of oil.

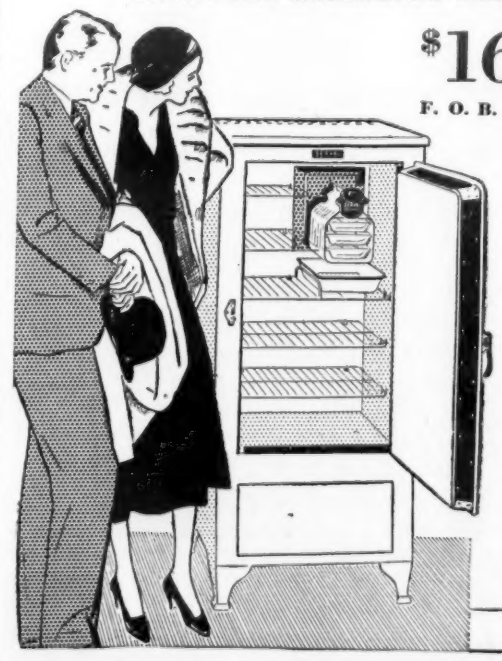
This puts an end to the costly Service Departments that ate up yesterday's profits. You are free from the bother and expense of kitchen repairs, field assemblies, intricate adjustments and replacement of parts.

All the parts most likely to cause trouble have been eliminated entirely. There are no expansion valves or float valves—no fans, belts or pulleys—no fuses or stuffing box seals.

The Servel Hermetic costs considerably less to operate—and it's the quietest electric refrigerator ever built. The beautiful cabinets are equipped with every worth-while feature.

With a complete range of sizes, at prices every family can pay—backed by a factory guarantee that protects both dealer and purchaser—you have a quick market, a tremendous market.

Write now for full details of the attractive dealer plan that insures more profitable business for you.



$165.00 and up
F. O. B. FACTORY

SEE THE SATURDAY EVENING POST MARCH 21st—Your customers are reading the beautiful full-color advertisements in The Saturday Evening Post—featuring the new Servel Hermetic. The next in this powerful series appears March 21st. Watch for it!

QUICK FACTS Hermetically sealed unit . . . No kitchen repairs . . . No intricate adjustments . . . No replacement of parts . . . Fewer moving parts . . . No moving parts exposed . . . Costs less to operate . . . Quietest unit ever built . . . Handy temperature control . . . More, usable shelf space . . . Beautiful, graceful cabinets . . . Flat, usable top . . . No installation problem . . .

SERVEL SALES, INC., EVANSVILLE, INDIANA
MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION

SERVEL
HERMETIC

WRITE FOR DETAILS OF OUR ATTRACTIVE DEALER PLAN

HARRISON MEN SEE SCHENECTADY PLANT

Newark, N. J., March 11.—A special train was chartered to take 125 members of the sales organization of Philip H. Harrison & Co., northern New Jersey distributors of General Electric refrigerators, to Schenectady to inspect the plant of the General Electric Co., today.

This morning the party will inspect the General Electric refrigerator unit and cabinet factories. Luncheon will be served at the Company's large plant restaurant.

During the afternoon the large motor and generator shops, turbine shop, station WGY and research laboratories will be inspected.

The party then will be conducted by buses to the Mohawk Golf Club, where dinner will be served, and addresses given by Mr. Chris Steenstrup, designing engineer of General Electric refrigerators; Mr. W. D. Hill, manager of refrigeration unit production, and others.

Among the guests accompanying the party are B. A. Seiple, commercial manager of Jersey Central Power & Light Co., of Asbury Park; A. D. Hobbie, president of Lovell-Dressel Co., Inc., Arlington, and Stanley J. Eisner, of Newark Paraffin and Parchment Paper Co.

The trip is being managed by T. E. Babson, sales promotion manager for the Harrison Co.; John H. Van Wie, of D., L. & W. Railroad, and F. C. Sarchet, refrigeration engineer of the G. E. at Schenectady.

BASSETT, STAR SALESMAN, VISITS KELVINATOR PLANT

Detroit—Richard R. Bassett was a visitor at the Kelvinator plant for three days early in March, with all expenses paid by the Virginia Public Service Co., as a reward for leading all of his associates in Kelvinator sales during the recent "Seven Sevens" campaign. His score was 27 Kelvinators during the five weeks' campaign.

He was recently promoted from salesman of the Clarendon division to assistant division merchandise manager at the main office of Virginia Public Service at Alexandria.

Before joining Virginia utility in May, 1930, he had been selling for a firm wholesaling automobile and radio supplies, accessories, and real estate.

PROUDFIT TO DISTRIBUTE MAJESTICS IN MONTANA

Lincoln, Nebr.—The R. S. Proudfit Co. has taken over the distribution of Majestic radios and refrigerators for the state of Montana. Offices, display rooms and warehouse have been located in Great Falls, Mont.

S. E. Ely, formerly of Naponee, Neb., has moved to Great Falls and will be the manager of the new branch. Mr. Ely has been with the Proudfit company for the past 28 years.

The Montana branch will operate as a separate unit, and all of its affairs will be handled from Great Falls.

CLAUDE NEON REPORTS 1930 BUSINESS

New York City—Claude Neon Lights, Inc., reports that consolidated sales by its associated companies in the United States for the year ending December 31, 1930, amounted to $15,349,497. For the year 1929, total sales were $15,778,893.

European Distributors See New Frigidaire Models

Twenty-four different nationalities are represented in this group of foreign distributors.

* * *

SERVEL ANNOUNCES NEW TIME PAYMENT PLAN

Evansville, Ind.—Time payment sales of Servel and Electrolux dealers and distributors will be financed by the Commercial Investment Trust Co. and the Bankers Commercial Security Co., both of New York City.

Arrangements with the Bankers Commercial Security Co. were recently closed by officials of Servel, Inc.

The arrangements completed with the Bankers company allow the dealers to make their own collections and thereby obtain a low finance rate.

Under the Bankers plan, the finance company withholds a 20 per cent initial reserve, refundable to the dealer in proportionate monthly installments.

The Commercial Trust plan enables the dealer to sell his retail paper on Servel and Electrolux refrigerators without any reserve or "hold back."

Commercial equipment and individual contracts for household equipment on which more than $750 is financed, will call for a 10 per cent reserve. All collections, according to this plan, will be made by the Commercial Investment Trust Co.

SQUARE D REPORTS PROFIT FOR 1930 OPERATIONS

Detroit—The Square D Co. for the year ended Dec. 27, 1930, reports a net profit of $113,959, after depreciation, interest and federal taxes.

This compares with a net profit of $503,829 in the year ended Dec. 31, 1929.

Profit for 1930 includes company's equity of $20,386 in the undivided profits of its affiliated Square D Co., Canada, Ltd., and $39,288 net profit before the acquisition in 1930 of the subsidiary Diamond Electrical Mfg. Co., after provision for minority interest.

WYATT JOINS DALRYMPLE COMPANY

Detroit.—Fred N. Wyatt has left the wholesale department of Caswell-Stull Inc., General Electric distributor, successors to McCormick-George Co., and is now with Dalrymple Co., Westinghouse distributor in Michigan.

He will cover his old territory in his new position with the Dalrymple Co.

Shannon Attends Paris Meeting

Dayton, Ohio—A spirit of optimism and enthusiasm prevailed at the European conference of Frigidaire distributing heads, held recently at the Hotel Continental, Paris, according to L. C. Shannon, foreign manager of Frigidaire Corporation, who just returned from abroad.

"The 1931 Frigidaire line was very well received at the Paris meeting, where 24 different nationalities were represented," Mr. Shannon said.

During his two months trip abroad, the Frigidaire foreign manager visited distributing headquarters of this General Motors subsidiary in France, Belgium, Holland, England and Germany.

He was the principal speaker at the Paris meeting, and also addressed a gathering of French Frigidaire dealers, which was held in the French capital.

ELECTROLUX ADVERTISING WINS HARVARD AWARD

New York City—Electrolux advertisements entitled "As Silently as Nature Makes Ice," which appeared in both the Saturday Evening Post and Good Housekeeping magazine last year, won for Batten, Barton, Durstine & Osborn, Inc., of this city, the 1930 Harvard

Prize-winning advertisement

award for the most effective use of headline.

The winning advertisement emphasized silence of operation and the headline drew attention to this appeal around which the Electrolux campaign was based.

Down the center of this advertisement a narrow color panel features in a simple but striking manner an every-day comparison to the silence of Electrolux.

KELVINATOR CORP. ISSUES BIG CAMPAIGN PORTFOLIO

Detroit—A 24-page portfolio, describing in detail "The Success Campaign," has recently been issued by the Kelvinator Sales Corp.

"The Success Campaign" is a spring selling program for Kelvinator distributors and dealers, and the portfolio presents the many angles of the ambitious plan which the factory is sponsoring for sales promotion, and urges dealer cooperation.

Magazine advertising plays an important part in the campaign. The various publications to be used are mentioned with many advertisements being displayed exactly as they will appear.

In connection with the magazine advertising, a series of ads designed to tie in with the Electric Refrigeration Bureau Campaign is presented.

In addition to this medium, radio, newspapers, outdoor advertising, trade papers and direct mail will be used extensively.

Many forms of dealer and sales helps and suggestions for window displays are discussed and reproduced to emphasize their effectiveness.

W. D. McELHINNY SPEAKS AT NEW HAVEN CONVENTION

New Haven, Conn.—New Haven Electric Co., 131 St. John St., Copeland distributor for Connecticut and western Massachusetts, recently held a two-day sales convention for dealers.

W. D. McElhinny, vice-president in charge of sales of the Copeland Sales Co., was the main speaker at the convention. Officers of the New Haven Electric Co. who also spoke were David Brigham, president; E. S. Belcher, vice-president; T. G. Tynan, sales manager; Frederick M. Dinan, advertising manager, and C. F. Ganter, refrigeration manager.

Do You Want a Position?

For the man who is seeking a new connection, "THE CONDENSER" column provides the opportunity of placing his message before refrigeration executives at small cost.

Here is what a recent advertiser says:

"I was particularly interested to learn what results could be expected with this type of advertisement and I am satisfied that your column is read by the type of executives I wanted to reach."

This column may also be used to advertise:

POSITIONS AVAILABLE
FRANCHISE OPEN
FRANCHISE WANTED
EQUIPMENT FOR SALE
EQUIPMENT WANTED
PROFESSIONAL SERVICES

See special rates at top of the Condenser Column

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance — Positions Wanted — fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS AVAILABLE

SALESMAN with knowledge of commercial line able to sell domestic line also. Write fully. Box 320.

POSITIONS WANTED

YOUNG man, married, at present profitably employed, desires position with growing power company or public service corporation in the capacity of refrigeration expert. Plenty of technical knowledge, but have not lost the ability to work. Two years' experience in General Electric factory. Will locate anywhere. Good references if desired. Box 319.

REFRIGERATION sales and service engineer, age 27, married, employed, desires change. Experienced retail sales and service management, factory service man, contact man establishing new dealers, instructing field men both sales and service, dealer education work sales and service, commercial estimating, also window trimming. Excellent reference. Also oil burner experience. Box 321.

EXPERIENCED commercial and domestic refrigerating man desires position with manufacturer or distributor. Qualified to serve as general manager or sales supervisor. Have full knowledge of new frozen foods equipment. Very best of references. Past position three years, previous position eastern sales manager for large refrigeration company. Box 322.

DISTRIBUTORSHIP WANTED

WELL financed organization experienced in the refrigeration field wants greater New York, or Bronx only, distributorship for reliable apartment house model refrigerator to be sold wholesale to builders and apartment house owners. Must be within all competitive prices. P. F. Thau, 2247 White Plains Ave., New York, N. Y. Estabrook 3592.

MISCELLANEOUS

WANTED General Electric refrigerator lifter. Box 37, Freeman, South Dakota.

WE have about 1500 surplus glass trays size 14½x12¼x2½" deep, suitable for storage or defrosting trays. Will sell cheap. Sneath Glass Company, Hartford City, Ind.

FOR SALE—Domestic refrigerator patents, patterns and tools. Also all material on hand. Ready to go ahead in production. Has been tested in field for 3 years and proven very satisfactory. Can be produced at a low price. Capacity up to 7 foot box. Box No. 323.

WE BUY
New and Used ELECTRIC REFRIGERATORS
In Any Condition
Phone, Write or Wire All Details, Type of Motor, Size of Box, Etc.
KASKEY & QUINN, Inc.
525 Arch Street Philadelphia, Pa.

REALISTIC DISPLAY FOODS
WILL INCREASE YOUR REFRIGERATOR SALES

Our Display Foods are carefully designed to demonstrate capacity and usefulness, clearly.

Realistic Display Foods will not melt, soften, and are non-peeling, non-fading, washable and chemically hardened.

A COMPLETE UNIT DISPLAY OF
27 PIECES PLUS
8 FREE ITEMS
20.00 F. O. B. Factory

Realistic Displays, Inc.
Factory and Offices
266 Fabyan Pl. Newark, N. J.

SUBSCRIPTION ORDER

Electric Refrigeration News
550 Maccabees Building
Detroit, Michigan 1931

Gentlemen: Please enter my subscription to ELECTRIC REFRIGERATION NEWS.

United States and Possessions: ☐ $2.00 per year ☐ Three years for $5.00
All other Countries: ☐ $2.25 per year ☐ Two years for $4.00
Refrigerated Food Section only $1.00 per year.

I am enclosing payment in the form of ☐ Check ☐ P. O. Order ☐ Cash

Name.....
Attention of or Care of.....
Street Address.....
City and State.....

Special Rates for Group Subscription Orders

For paid-in-advance subscriptions in United States only. Send check with order. Papers will be mailed to individual addresses.

5 or more subscriptions entered at one time, $1.75 per year each.
20 or more subscriptions entered at one time, $1.25 per year each.
10 or more subscriptions entered at one time, $1.50 per year each.
50 or more subscriptions entered at one time, $1.00 per year each.

3-11-31

In Glistening White Porcelain Enamel

Made in Three Popular Sizes

Fits All Types of Refrigerators

ADOPTED AS STANDARD EQUIPMENT BY MANUFACTURERS!
PRICED ESPECIALLY LOW FOR DISTRIBUTORS. WRITE FOR SAMPLES AND PRICES
THE BELLAIRE ENAMEL CO., BELLAIRE, OHIO
Enameled Refrigerator Utensils *Enameled Defrosting Pans*

Refrigerated Food Section

In Three Parts—Part 2

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
VOL. 5, NO. 14, SERIAL NO. 116

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DETROIT, MICHIGAN, MARCH 11, 1931

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FIFTEEN CENTS PER COPY
TWO DOLLARS PER YEAR

MIDDLETOWN MEN RECOGNIZE VALUE OF REFRIGERATION

Confectioneries, Restaurants, Meat, Grocery Stores Well Equipped

By George F. Taubeneck

Middletown, Ohio—"Electric refrigeration saves us time and trouble," claims a chorus of food store proprietors in this city of 30,000.

A survey recently made of the meat markets, grocery stores, delicatessens, restaurants, and confectioneries in that city discloses the fact that a majority of these shops have been equipped with electric refrigeration for periods running from a few weeks to six years. Ice is still in evidence, however.

At each of the stores where these installations have been made, one is told that not only is the new method of refrigeration much superior to ice from the standpoint of efficiency and economy, but that it saves a lot of time and trouble, and eliminates musses.

Moreover, service calls on these machines are few and far between, if one may believe the proprietors of these stores.

For example, the visitor to Middletown might walk into the modernistically designed Roy's Lunch, which has cubistic metal doors and furniture, and a bizarre display window.

Therein the visitor would find a new Frigidaire ice cream cabinet, a large Frigidaire commercial wallbox, and a big cooler in the kitchen refrigerated by a Lipman machine.

The latter has been in constant service for the last five years, and has rarely given cause for complaint.

Just five weeks ago the Star Meat Market installed complete new refriger-

(Concluded on Page 8, Column 1)

BORDEN TO DISTRIBUTE FROZEN ORANGE JUICE

New York—Distribution of frozen orange juice to retail stores and consumers in New York City by Borden Farm Products Co., will begin some time this month, according to an announcement by Borden officials.

The company has leased space in the Union Terminals, at Tampa, Fla., where the juice is to be extracted, packaged and frozen. It will be kept frozen during storage and while in transit from Florida to New York.

Whether or not the juice will be sold to consumers in a frozen state has not been decided. If experiments prove that the product can be defrosted after its arrival in New York and still reach consumers in a satisfactory condition, this method will be tried.

Through retail stores and the company's house delivery system the juice will be sold in the same manner that milk is retailed. Special delivery equipment will not be required. Plans now are to use a fibre container holding one-half pint.

If, after experimenting in one or two districts of the city, the scheme proves successful, distribution will begin in other areas, and decision will be made regarding its sale in other parts of the country.

Borden is the second dairy company to try distribution experiments in frozen orange juice along with its delivery system. National Dairy Products Corp. has recently announced distribution of frozen orange juice in Chicago.

SOCIETY ENDORSES ROGERS FOR AGRICULTURAL BOARD

Benton Harbor, Mich.—A. J. Rogers, the fruit grower of Traverse City, who addressed the November 24 low-temperature meeting of the Detroit section of the A. S. R. E., and furnished frozen cherries for the pies served before the meeting of November 24, has been endorsed by the Michigan State Horticultural Society for the Republican nomination as member of the State Board of Agriculture.

Mr. Rogers is president of the Michigan Cherry Growers, Inc., and served two terms as president of the horticultural society.

'No Waiting To Be Waited On'

G. W. Nash (above center) keeps extra clerks on hand to give his customers quick service.

KROGER STORES WILL SELL MEALS, DRINKS

Cincinnati—Meals, lunches, confections, and soft drinks may be had at Kroger stores soon. Stockholders of the Kroger Grocery and Baking Co. voted an amendment to the code of regulations at their recent annual meeting to permit such service.

It was also voted to set aside 100,000 shares of common stock for purchase by officers, executives and employes.

In line with Kroger's expansion policy, Kroger units will be installed in the Sears, Roebuck & Co. stores at Minneapolis, Minnesota, in the near future.

A similar unit installed several months ago in a Chicago Sears-Roebuck store obtained such satisfactory results that Kroger officials plan installations of that type in Louisville, Kansas City, Cleveland, Pittsburgh, Detroit, St. Louis, Memphis, Indianapolis, and other large cities.

Carrying approximately 1,600 food items, the Kroger unit in the Chicago Sears-Roebuck store established a sales

(Concluded on Page 7, Column 2)

Ice Cream Vender Uses Dry Ice

Cleveland—Refrigeration played an unimportant role in the annual convention of the Coin-Machine Operators Association of America, held here Feb. 24 and 25.

Only one refrigerated vending machine was on display at the convention. It was an ice cream bar vender, cooled by solid carbon dioxide, made by the Ice Cream Vending Machine Co. of Kansas City.

This machine holds 58 ice cream bars of the Eskimo Pie type. When loaded with four pounds of solid carbon dioxide, its makers claim it will operate for 48 hours without attention.

The same company advertised a bottle drink vender, also refrigerated by solid carbon dioxide, which has a capacity of 120 bottles. A change-making device is furnished.

Other exhibitors of food-vending machines stated that they were experimenting on refrigerated machines, but had nothing ready to market as yet.

Officers of the Mills Novelty Co. claimed quick turnover made refrigeration unnecessary.

LUXURIOUS TOLEDO STEAK SHOP OPENED

Toledo, Ohio—Toledo's newest butcher shop, with velvet carpeting, reed furniture and floor lamps, opened recently at 412 Madison Ave., in the heart of the downtown district.

The new market, known as the "Steak Shop," is believed to be the most elaborately decorated and arranged meat market in the city. Instead of the old-time sawdust covered floors, there are thick velvet carpets.

Vases of flowers are found on the counters, bridge lamps are placed in appropriate places, reed and upholstered furniture make it convenient for customers who wish to rest, and pretty girls are hired as clerks.

It is equipped with 64 ft. of white porcelain display counters, installed by the McCray Refrigerator Sales Corp., of 139 N. Erie St., Toledo.

After the meat is cut into desirable sizes in a back room, it is placed on lettuce leaves in the refrigerated counters, where it is kept at a temperature of 38 degrees until purchased.

Pioneering Swift's Frozen Meats

Copeland-Warren low temperature equipment is used in the Nash Food Store

NASH FOOD SHOP GIVES CUSTOMERS WHAT THEY WANT

Small-Town Merchant Sells Swift Identifiable Meats to Quality Trade

By George F. Taubeneck

Downers Grove, Ill.—Grant W. Nash believes in giving his customers what they want.

He calls his Nash Food Shop a "service store," keeps a fast delivery car on the road at all daylight hours, purposely maintains an oversupply of clerks so that no customer need wait to be waited upon, is well stocked at all times, and strives to make his store as attractive as food stores can be made.

In accordance with this idea, a policy established for the Nash Food Shop some 40 years ago by his father, Nash added a complete line of Swift's "Identifiable" (quick frozen) meats late in October last year.

"I'm not making a particularly handsome profit off the sale of quick frozen meats," Nash admits, "but the line more than pays its own way.

"More important to me than immediate profits is the fact that I'm building good will among my customers," he maintains.

"If they want spring chicken, ducks, or turkeys out of season, I have these items for them. And I find my customers like the sanitary nature of quick frozen meats.

"It won't be long before the public will become better educated to the availability of these products, and then I expect to make good money from the line."

In the Nash store are two Warren display cases and a specially built War-

(Concluded on Page 8, Column 2)

BRITISH GOVERNMENT MAY ENTER FOOD BUSINESS

London, England—Milk, potatoes, hops, wool, cereals, cheese, cattle, sheep, pigs, poultry, eggs, and fruit are among the farm products which may be marketed under the regulation of Great Britain's labor government, should the agricultural marketing bill receive final approval.

This bill, which has passed its second reading in the House of Commons, would make Minister of Agriculture Christopher Addison potential director of a $2,000,000 farm industry.

In accordance with its provisions, boards would be set up to regulate various farm products by a factory-like system under which the farmer's work would be completed with the harvest.

After that event the boards would take complete charge of grading, marking, storing, advertising, transporting, and marketing.

Farmers in each district would take the initiative for forming a regulating board, according to the plan. Approval of a majority of the farmers in each district, however, would not be needed to make the actions of the board binding on all.

Sponsors of the bill hope that these boards can eliminate much of the wholesalers' profits, as well as bettering production methods, and thus give the farmers better prices.

At present Great Britain produces only

(Concluded on Page 8, Column 2)

MILLS, HOAGLAND ELECTED ARMOUR VICE-PRESIDENTS

Chicago—Armour & Co. announces the election of two new vice-presidents to head executive departments.

H. G. Mills, former manager of the plant of the New York Butchers' Dressed Meat Co., has been elected vice-president in charge of plant management, to succeed Williard C. White, resigned.

I. M. Hoagland has been appointed vice-president in charge of domestic sales and market operations. Mr. Hoagland was formerly general manager of branch house sales. He is now given supervision of car route and other distribution activities.

BIG MARKET FOR DAIRY REFRIGERATION

MILK MUST BE KEPT AT 50° TEMPERATURE

By Beulah Canterbury

IN the United States 25,700,000 dairy cattle produced the 2,666,600,000 gallons of milk consumed by the American public last year.

With the extension of 150,000 miles of electric power lines into the countryside, the majority of the 3,728,587 dairy farms in the United States are now potential customers for electric refrigeration.

The success of the dairy farmer today is in exact ratio to the quality and wholesomeness of his milk, and that quality is determined largely by the rapidity with which milk is cooled after removal from the cow.

Immediate cooling of the milk and keeping it at a constant temperature of 50 degrees or less safeguards the dairyman against loss, as the milk is returned to the farmer if its bacteria content is too high.

Dairy Industry Big

The dairy industry, next to that of raising livestock for slaughter, is the largest single branch of agriculture. Dairymen have a combined investment of $912,532,000 in dairy cattle.

The first questions a dairyman asks the electric refrigerator salesman are: "What does it cost to cool milk with electric cooling equipment?" and "How does the cost compare with the cost of cooling with ice?"

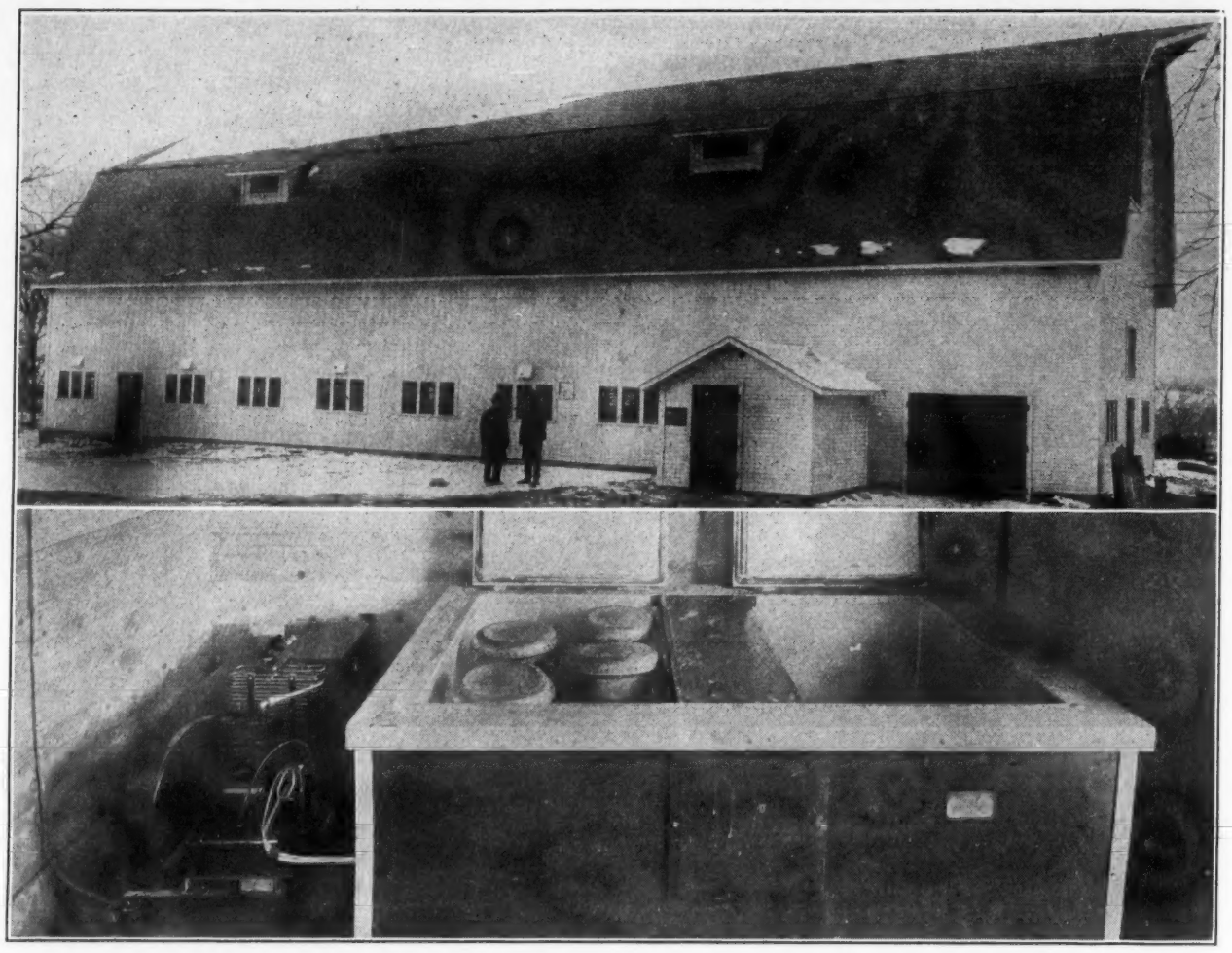
These questions are asked more and more frequently as state regulations on cooling are becoming more and more stringent, and as bonuses for high-grade milk are becoming prime factors in increasing the dairyman's profit.

The writer made a survey of 11 dairy farms situated in different sections of a middle western state and having from 15 to 75 milking cows, to determine the costs of ice and electric cooling of milk.

Prior to the installation of mechanical refrigeration, the 11 dairy farms were using an average of 6 lbs. of ice per day for each gallon of milk cooled, at an average cost of 40 cents per hundred pounds. On this basis, the average cost of ice per gallon was 2.4 cents per day, and the average cost per month for each gallon of milk produced was 72 cents.

After installing electric refrigeration, the owners of these 11 dairy farms, all of whom were delivering bottled milk to retail customers, reported savings. The estimated figures are as follows:

Frigidaire Equipped Dairy Farm



Large dairy farm equipped with electric refrigeration for the cooling of milk. The job is handled by a Frigidaire unit hooked-up to a Nagle cooler. In the two compartments of the cooler a total of eight large cans of milk can be cooled to the proper temperature at one time.

Refrigeration Required at Retail Farm Dairies

To cool 1 gal. milk from 95° to 40° F	3.5 lb. refrigeration
To cool bottles or cans	1.5 lb. refrigeration
Two lbs. ice to crack over 1 gal. milk en route to market	3.2 lb. refrigeration
To provide cold storage and allow for losses	2 lb. refrigeration
	10.2 lb. refrigeration

(One lb. refrigeration equivalent to "cold produced" by melting of 1 lb. ice.)

The operating cost varied, but at 4 cents per kwh., the average cost of electricity for operating the refrigerating equipment on the 11 farm dairies was 30 cents per month for each gallon of milk produced per day, or 1 cent per gallon of milk cooled. This made a saving of 42 cents per month for each gallon produced per day.

That electrical refrigeration produces a saving over ice in the small dairy farm as in the larger one is shown by the following table:

With the advent of electric refrigeration on the farm, many rural dairymen have become retailers with their own door-to-door routes and their own clientele.

These dairymen usually concentrate on a particular kind of milk, either Holstein, Jersey, Guernsey, or some combination such as Hols-Guerns milk, combining milk from two different breeds of cows.

Using electric refrigeration, the dairymen are able to sell grade A raw milk with an extremely low bacteria count for from 3 to 6 cents a quart more than the retailing price of commercial pasteurized milk.

What One Man Did

An instance of the difference electric refrigeration has made in the economic status of one farm family is shown on the Hol-Guerns farm of F. X. Meyer, in Stark County, Ohio. For five years Mr. Meyer and his family made a bare living raising cattle and selling 100 gallons of milk a day to a city pasteurizing plant.

When the electric power lines were extended to the Meyer farm, he bought electric refrigeration equipment so that he might produce grade A raw milk under county and city health laws, and retail it himself. In the last five years Meyer has built up a 1,000 quarts a day retail route totaling about $50,000 a year business.

Low bacteria count milk brings in bonuses from the city milk companies. Bonuses vary in different sections of the country and run from 15 to 60 cents per 100 pounds.

Rural electrification has been rapid the last two or three years. In the state of Illinois only 2,201 farms had electric power in 1924; in 1930, 15,000 Illinois farms were served with electricity. Indiana now has 16,000 farms on electric lines, while California has 55,000 electrified farms.

Comparative Cooling Costs

Approximate Cost of Cooling Milk with Electric Refrigeration as Compared with Use of Ice

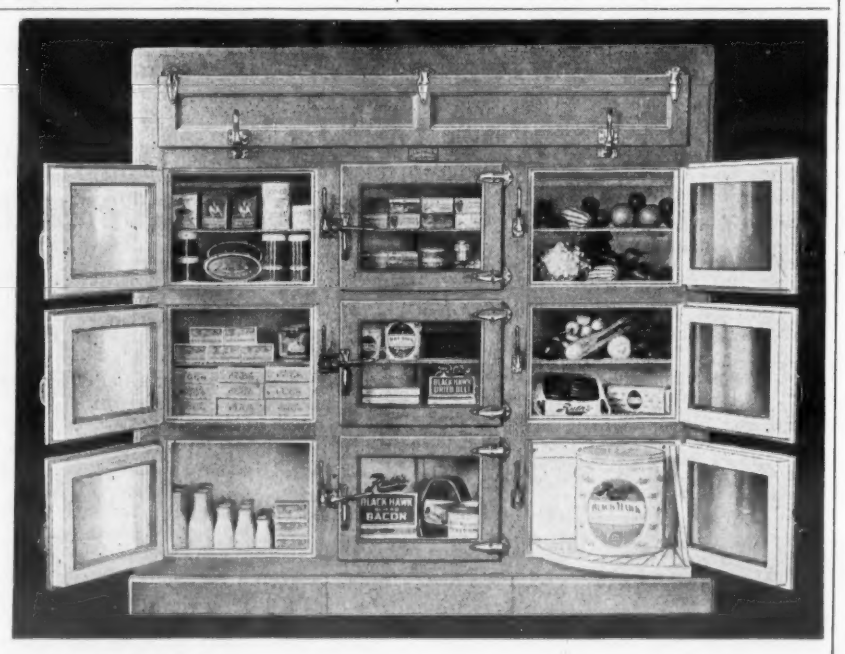
Quarts Milk	Approx. Motor	Electricity 5c per K. W. ELECTRICITY Day	Month	Year	To cool milk from 90° to 45° ICE Day	Month	Year	Ice 40c per hundred SAVING Day	Month	Year
80	1/4	.12½	3.60	43.00	.30	9.00	108.00		5.40	64.80
160	1/3	.25	7.50	90.00	.60	18.00	216.00		10.50	126.00
240	1/2	.35	10.50	126.00	.80	24.00	288.00		13.50	162.00
320	1/2	.45	13.50	162.00	1.00	30.00	360.00		16.50	198.00
400	1-1/2	.45	13.50	162.00	1.30	39.00	468.00		25.50	306.00
480	1-1/2	.54	16.20	194.40	1.50	45.00	540.00		28.80	345.60
560	1-1/2	.60	18.00	216.00	1.75	52.50	630.00		34.50	414.00
640	1-1/2	.70	21.00	252.00	2.00	60.00	720.00		39.00	468.00
					To cool milk from 65° to 45°					
80	1/4	.08	2.40	28.80	.20	6.00	72.00		3.60	43.20
160	1/4	.11	3.30	39.60	.30	9.00	108.00		5.70	68.40
240	1/3	.18	5.40	64.80	.45	13.50	162.00		8.10	97.20
320	1/3	.23	6.90	82.80	.55	16.50	198.00		9.60	115.20
400	1/2	.28	8.40	100.80	.65	19.50	234.00		11.10	133.20
480	1/2	.33	9.90	118.80	.75	22.50	270.00		12.60	151.20
560	1/2	.38	11.40	136.80	.85	25.50	306.00		14.10	169.20
640	1/2	.42	12.60	151.20	.95	28.50	342.00		15.90	190.80

Extra Profits in Premiums

Table Showing Extra Profit on Milk in Premiums at the Following Prices Per 100 Lbs.

Premiums paid at 15c—25c—40c—60c per 100 lbs.

Qts. Milk 2 Milkings	Lbs. Milk 2 Milkings	Daily Profit			Monthly Profit				Yearly Profit			
80	173.6	.26	.44	.70	1.04	7.80	13.20	21.00	31.20	93.60	158.00	252.00	374.40
160	347.2	.52	.87	1.39	2.09	15.60	26.10	41.70	62.70	187.20	313.20	500.40	752.40
240	520.8	.78	1.30	2.09	3.13	23.40	39.00	62.70	93.90	280.80	468.00	752.40	1129.80
320	694.4	1.04	1.74	2.78	4.17	31.20	52.20	83.40	125.10	374.40	626.40	1000.80	1501.20
400	868.	1.30	2.17	3.48	5.21	39.00	65.10	104.40	156.30	468.00	781.20	1252.80	1875.60
480	1041.6	1.56	2.61	4.17	6.25	46.80	78.30	125.10	187.50	561.60	939.60	1501.20	2250.00
560	1215.2	1.83	3.04	4.86	7.29	54.90	91.20	145.80	218.70	658.80	1094.40	1749.60	2624.40
640	1388.8	2.08	3.47	5.56	8.35	62.40	104.10	166.80	249.90	748.80	1249.20	2001.60	2998.80



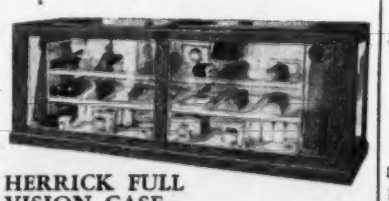
A NEW

HERRICK

with NEW sales Possibilities

This new HERRICK, built for overhead refrigeration, should mean easier sales and added sales for every dealer in mechanical refrigeration. Its added conveniences and increased storage facilities make an instant appeal to the grocer. The working height of the refrigerator is available for food storage. The heavy tinned wire shelving is continuous, reaching without obstruction from wall to wall. Good air circulation is assured by a duct down the back of the refrigerator, insuring penetration of the cold air to every shelf and clear to the floor of the refrigerator. Restaurant as well as grocer models available.

Write for pamphlet describing the new HERRICK for overhead refrigeration and showing four models at present carried in stock, with complete specifications.



HERRICK FULL VISION CASE
—a most effective and economic display unit with coils at each end.

HERRICK REFRIGERATOR CO.

1003 RIVER ST. WATERLOO, IOWA

REFRIGERATION WINNER AT FOOD SHOW

Detroit—Refrigeration added to its score at the Builders, Realtors and Food Show here February 25-March 8, when the Frigidaire Sales Corp. won first honors for the best display.

In the section devoted to household appliances, refrigerators were displayed by the Absopure Refrigeration Corp., Copeland Refrigeration Co., Caswell-Stull, Inc. (General Electric), Dalrymple Co. (Westinghouse), Detroit City Gas Co. (Electrolux), Frigidaire Sales Corp., Kelvinator Sales Corp. and the Norge Corp.

CLEVELAND UNIVERSITY USES TEN FRIGIDAIRES

Cleveland—Western Reserve University recently purchased ten Frigidaire cabinets from the commercial division of Frigidare Sales Corp., 1371 Euclid Avenue.

LYNN COMPANY EQUIPS POST OFFICE

Lynn, Mass.—Nelson-Russell, Inc., Kelvinator distributor, recently installed a water cooling system in the U. S. Post Office.

The equipment consists of a CW-72 cabinet cooler, serving approximately 50 employees of the building, and some 60 mail carriers who work out of the post office.

HERRICK OFFERS NEW COMMERCIAL MODELS

Waterloo, Iowa—Four new commercial refrigerators, using the overhead system of cooling, for installation in groceries, restaurants and other food shops, have been placed on the market by the Herrick Refrigerator & Cold Storage Co. of this city.

In all four models the top coil compartment allows for the installation of cross fin coils. Shelves do not run to the back wall, according to E. D. Northey, vice-president of the company, but are turned up and supported about 3 in. away from the rear wall.

This forms a duct or open space down the back of the refrigerator, Mr. Northey points out, so that cold air circulates over each storage shelf, and also travels to the floor of the cabinet.

The continuous wire shelving running from one end wall to the other is heavily tinned and turned up in the back to prevent food products from being pushed into the air duct.

Comprising the new lines are Model No. 914 with solid doors and 48 cu. ft. capacity, No. 915 with glass doors and 48 cu. ft. capacity, No. 919 with solid doors, meat hanging compartment and 77.46 cu. ft. capacity, and No. 966 with glass doors and 78.31 cu. ft. capacity.

All of the models have front and ends of oak, with back, bottom and top of beaded fir. Interiors are lined with white, odorless Washington spruce. Insulation is Mineral Wool, 2 in. thick, with three-ply sheeting on each side.

Solid oak panel doors used on two of the models are insulated the same as the refrigerator walls. The glass display doors have three thicknesses of plate glass.

In the coil compartment an L type baffle with ½ in. board insulator and covered with galvanized sheet steel is used. The vertical section of the baffle is removable for coil installation and service. Leading to the coil compartment is a long door which swings upward and is held in an open position with wire fasteners.

FROZEN MEATS DISPLAYED AT TEXAS STOCK SHOW

Fort Worth, Tex.—General Electric refrigerators were displayed by Griswold-Rogers Co., Inc., at the Southwestern Exposition and Fat Stock Show which opened here March 7 for a week's run.

Frozen meats occupied a prominent place in the exhibit through the co-operation of Swift & Co. and Armour & Co.

General Electric refrigerators were used by Madame Veverka at the Charm School conducted by the Fort Worth *Star Telegram* several weeks ago.

Recently, Griswold-Rogers participated with other refrigerator dealers in the Cooking School held by the same newspaper, which was under the direction of Mrs. Ida Chitwood.

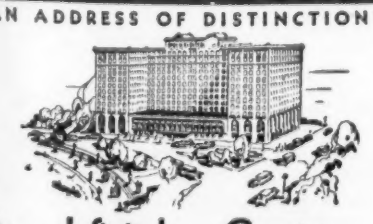
PROVIDENCE SCHOOL USES G. E. TO COOL MILK

Providence, R. I.—One of the city's new million dollar Junior High schools has been equipped with electric refrigeration by Gentsch & Thompson, General Electric distributors.

A large commercial refrigerator, CS-600, located in the Students' Lunch Room, has been specially equipped to hold 936 half pints of milk which are sold to the youngsters at a cost of three cents each. The stock model would hold only 800 jars of milk, and six additional shelves were installed to allow for increased capacity.

Five other G. E. refrigerators were installed in various departments of the school.

"AN ADDRESS OF DISTINCTION"



Infinitely... Greater Value

AT THE DRAKE you will enjoy spacious quarters . . . beautifully furnished. A dining service internationally famous . . . a quiet . . . restful location . . . and convenient to all Loop activities. *Rates begin at $5 per day. Permanent Suites at Special Discounts.*

THE DRAKE HOTEL, CHICAGO
Under Blackstone Management

You don't judge Apples by size alone...

Why judge ☆ INSULATION *by conductivity only!*

WHAT'S the test of an insulating material? Too often the answer is merely "low conductivity" (resistance to the passage of heat). Too often conductivity is determined under ideal conditions in the laboratory. While this feature is of prime importance in insulation, it is not by any means the whole story of a material's efficiency.

Consider, for instance, moisture resistance. If the insulation absorbs moisture readily, it will soon lose its efficiency. And moisture is ever-present in low temperature work.

When you specify insulation for your equipment, whether for the new low temperatures quick-freeze demands or for ordinary refrigeration, consider *all* the factors that go to make a good insulating material. Conductivity, yes—but also moisture resistance, strength, ease of installation, resistance to deterioration, whether it will serve without settling—period of high efficiency—everything that makes for permanent service. Judged by these standards, there is one insulating material that will always stand out—Armstrong's Type LK Corkboard.

Corkboard has low conductivity—as proved by impartial tests. And it also possesses the other essential points* of an ideal insulation. Properly installed by equipment manufacturers, Armstrong's Corkboard provides permanently efficient and reliable insulation.

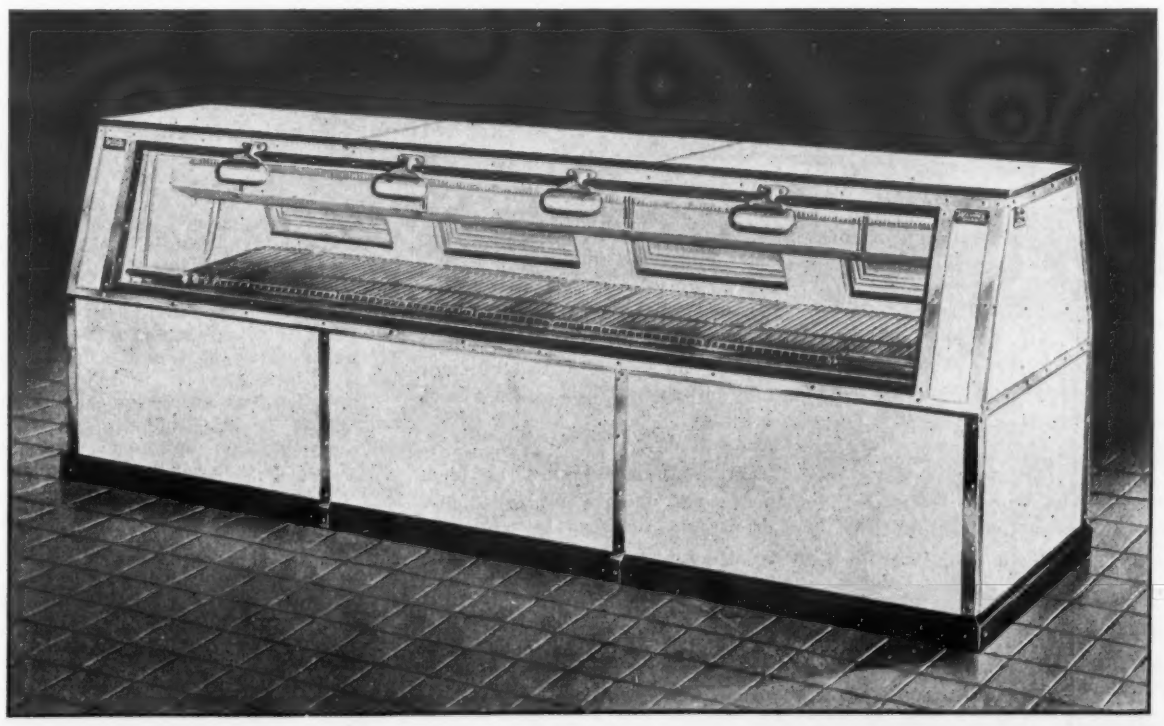
Armstrong's research laboratory has made special studies of matters relating to the insulation of low temperature commercial cases. The results of these studies and investigations are at your service. No matter what your requirements, there is bound to be something in this experience of value to you. Write to Armstrong Cork & Insulation Company, 917 Concord Street, Lancaster, Pa.

Wherever refrigerating machinery needs cold lines, Armstrong's Cork Covering, in 3 thicknesses, provides ideal pipe insulation. *Icewater* thickness is used for temperatures as low as 35° F.; Brine thickness to 0° F.; and *Special Brine* thickness as low as 25° below zero F.

☆ *Star these 6 questions when you buy insulation:*

- *** Is it an efficient barrier to heat?**
- *** Will it resist moisture?**
- *** Will it serve without warping, shrinking, buckling, or settling?**
- *** Will it resist decay and deterioration?**
- *** Has it structural strength?**
- *** Is it permanently reliable?**

Armstrong's (A) *Product*



This commercial display case manufactured by The Warren Company is insulated with Armstrong's Corkboard. Here the insulating material was specified for low conductivity as well as for its other superior features.

AT YOUR SERVICE

Twenty-eight Armstrong Cork & Insulation Company branches at the following cities are ready to serve you. See Telephone Directory for street address of the branch office nearest you.

Albany, N. Y.; Atlanta, Ga.; Birmingham, Ala.; Boston, Mass.; Buffalo, N. Y.; Charlotte, N. C.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Dallas, Tex.; Denver, Colo.; Detroit, Mich.; Grand Rapids, Mich.; Houston, Tex.; Jacksonville, Fla.; Kansas City, Mo.; Memphis, Tenn.; Milwaukee, Wisc.; Minneapolis, Minn.; New York, N. Y.; Omaha, Neb.; Pittsburgh, Pa.; Rochester, N. Y.; St. Louis, Mo.; Syracuse, N. Y.; and in Canada—Montreal, Toronto, Winnipeg.

Armstrong representatives are located in the following cities: Baltimore, Md., John R. Livezey; Los Angeles, Cal., Gay Engineering Corporation; New Orleans, La., H. T. Steffee; Philadelphia, Pa., John R. Livezey; Spokane, Wash., D. E. Fryer & Company; Portland, Ore., Gillen-Cole Company; San Francisco, Cal., Van Fleet-Freear Company; Seattle, Wash., D. E. Fryer & Company; Washington, D. C., John R. Livezey.

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Armstrong's TYPE LK Corkboard Insulation

Efficient and Practical Insulation for Refrigerating Equipment

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Strength of Roots

THOSE who express impatience at the seemingly slow progress of quick-frozen food distribution may find mollification in the fact that this careful development of a new industry is likely to insure strength of roots and growth along sound lines.

Many close observers of the Springfield campaign on Birdseye Frosted Foods have been inclined to agree that this experiment was a wise move. Sales were confined to one small area, where advertising and merchandising could be done on a worthy scale without subjecting the company to heavy losses should the campaign prove to be a fizzle.

The outlets were few enough that each could be watched minutely, and such details as the number of times a merchant would open and close the doors of his display case per day could be recorded accurately and tabulated.

Not only was public acceptance of these new food products tested, but low temperature equipment was observed under fire. In many cases it was found wanting, and manufacturers returned to their laboratories to perfect their designs. Recently they have emerged from these laboratories with new cases which apparently meet all the requirements postulated after the Springfield experiment.

Birdseye Campaign

So well satisfied are General Food executives with these new cases and with the results obtained at Springfield that this year they are planning to extend the sale of Birdseye Frosted Foods throughout New England.

In a rather difficult position are the meat packers who have been experimenting with quick-frozen foods. Swift & Co., for instance, is said to have suffered occasional heavy losses of business from retaliating butchers in the cities which Swift's "Identifiable" meats have been merchandised.

At present the retail meat business is the bread and butter of Swift and other big packers, and officials of the organization feel that they can't afford to wave a red flag at those of their customers who choose to treat quick-frozen meat merchandising as a mortal enemy.

For that reason, chiefly, Swift activities in this field have been kept as quiet as could reasonably be expected. No sales campaigns have been conducted. Peaceful penetration has been the order of the day.

Swift Approves Cases

Swift & Co. engineers have been working closely with some of the case manufacturers and with a few makers of the electric refrigeration machines. Although no confirmation has come from Swift officials, a number of case manufacturers are known to have prepared sample low temperature display and storage cabinets to Swift engineers for testing in a laboratory supposedly similar to the one set up by General Foods Corp. in the Batchelder, Snyder, Dorr & Doe packing house at Boston. At least five case manufacturers claim to have received official approval of their equipment from Swift authorities.

Whether or not this approval of equipment presupposes a possible opening up of the market for Swift's quick-frozen meats is a matter of conjecture, but indications all point toward a continuation of the Swift policy of silence and slow development of outlets for some time yet.

Armour Experiments

From Armour & Co. the possibility of accelerated development of quick-frozen foods seems even more remote. In spite of repeated denials by company officials, it is known that Armour men have been experimenting with quick-frozen meats for some time, using a method that requires extremely low temperatures.

None of these quick-frozen products has ever been placed on sale, however, and Armour executives steadfastly maintain that their company will not enter the field.

Getting down to the retailer, one finds that in many places where quick-frozen foods have been introduced a real job of local education has been accomplished.

Springfield, Massachusetts, as has been noted, is the scene of strong and sustained demand for these food products. Retailers here have been aided by the heavy local advertising of the General Foods Corp. (which, not depending on butcher outlets for much of its business, has little to lose and everything to gain by the promotion of quick-frozen meats and vegetables).

Local Retailers

In other cities less heralded enterprising grocery storekeepers have quietly but effectively broadcast the news of this innovation, and have backed it by the reputation they enjoy locally.

In this issue is reported the story of a grocer in Downers Grover, Illinois, who has been gradually building up an increasing demand for quick-frozen meats among his clientele. He claims that he makes little money on this line right now, but is watching with satisfaction the growth of public acceptance of these products in his community.

Never does he neglect an opportunity, he declares, to tell the story. And because he and his father together have supplied foodstuffs to inhabitants of this town for more than four decades, his customers are listening to the story, trying the new packaged meats, and making repeat orders.

Slow Development

If retail outlets be carefully chosen, especially with reference to the respect accorded them in their communities, and to their enthusiasm for the new line, packers of quick-frozen foods and makers of low temperature equipment should have little to complain of in regard to local education. But the process of making a nation conscious of the advantages of packaged, sharp-chilled products may be slow indeed.

The task of public education is one which properly will be shared by the packing and refrigeration industries in common with the local retailers of these products when the full story is known and ready to broadcast. Perhaps, when that time arrives, even the butchers will find enough merit in it to cease their efforts to halt the progress of a coming industry.

GLEANINGS
FROM RECENT PERIODICALS

"By use of the kitchen and expert judges, it is believed accurate information about the effect of various feeds upon the palatability of meat will be obtained to aid in raising superior meat-producing animals."—*Popular Science.*

"While supply of frozen fish is decreasing rapidly, the crews of 200 boats of the North Pacific halibut fleet refused to go to sea as the season opened, as result of disagreement with ship owners. Only a half dozen boats are on their way to the banks."—*N. Y. Times.*

"Shrimp packers have found in quick freezing the ideal answer for a simple, inexpensive and natural means for preserving quality. It eliminates crushing and softening in transit and deterioration from long standing due to overstocking, and enables quick handling.

"While virtually all shipments now are in bulk, undeniable benefit will come to both packer and retailer when the product can be distributed generally in small consumer packages."—*Fishing Gazette.*

"Development of an effective method of preserving fruit juices by freezing in order to retain natural qualities seems near as result of experiments by the Department of Agriculture.

"Many samples so preserved were found to have retained all the natural characteristics of the original juice, which are somewhat impaired by the heat preserving process. Frozen orange and grapefruit slices proved satisfactory, but bananas were best eaten while still frozen, losing their firm texture upon defrosting."—*U. S. Daily.*

An Editor on Wheels

Stories of Interesting PLACES in the Refrigeration Industry

By GEORGE F. TAUBENECK

Cleveland, Ohio

Somehow urban Ohio, on the westerly side, seems to have a tang of freshness, a dress of cleanliness, and an honest face which defy comparison and beggar description.

Dayton, Columbus, Cincinnati, Toledo, Cleveland—all have a flavor to be found nowhere outside of Ohio, and which may be recognized distinctly within an hour after arrival.

As a prototype of this distinct group, Cleveland represents industry, solidity, spaciousness, and—above all—community pride.

It is a city of hard-working men and women who appear to have made up their minds that Cleveland is the finest spot on earth, who mean to live there always, and who are constantly trying to make it more worthy of their pride.

Cleveland's population seems *settled.* A comparatively high percentage of the citizens own homes. All of this makes for stability and homogeneity.

Wide streets, plenty of open space, and gaps between buildings permit the circulation of plenty of fresh air and sunshine.

Whether or not the town's main street was named for Euclid, the father of geometry, we don't know. But the man who systematized the mathematics of lines and circles and angles would enjoy hugely the haphazardly geometrical layout of Cleveland's streets.

Among Cleveland's showplaces is its recently erected Union Railroad Terminal, an edifice of which any city in the nation might be proud. Nothing in Europe, we are told, can touch it for the combination of symmetry, proportion and utility.

Beautiful homes are there, in abundance; and almost every one of Cleveland's homes seems to have somebody present who is trying to make that particular habitation a pleasant place to look upon as well as to live within.

No peculiar characteristic of the city's dress is noticeable. Often one can spot a man or woman from Chicago, New York or Boston by the clothes he or she wears and the manner of wearing. But not those who hail from Cleveland.

Perhaps distinctive dress in Cleveland isn't deemed important, because the people there are so universally good looking.

Almost any single man who travels much is ready and willing to talk about how overstocked Cleveland is with pretty and even beautiful girls.

And even the happily-married oldsters who attend G. E. conventions like to talk about the eye-opening lasses who appear as entertainers.

Lest any reader become a little too ambitious, it might be suggested that the men in Cleveland, taken largely, are also attractive. The law of Natural Selection seems to be in force to an unusual degree.

Neither East nor West is Cleveland. Those from the middle and far West who go there are impressed with the Eastern tang to the conversations and habits of Clevelanders. Easterners, on the other hand, often find definite traces of the West in Cleveland's inhabitants and institutions.

It is a border city, where strains from two great sections of the nation are commingled and conjoined. This fact partly accounts for Cleveland's distinct individuality.

* * *

Middletown, Ohio

Contractors and builders have probably made good money in Middletown. Big factories, fine homes, and a surprising number of sizeable edifices are located here in this town of 30,000.

American Rolling Mills, of course, dominates Middletown. A massive plant, an office building which looks like a first-class high school building, a good hotel, and other miscellaneous buildings have been erected here by the Armco people.

Old Gold cigarettes and Beech-Nut chewing tobacco are also manufactured in Middletown. Several mills manufacture paper in large quantities.

It takes a great many major and minor executives to man companies like American Rolling Mills and P. Lorillard, and most of these officials live in most attractive homes.

The number, size and style of the public buildings are amazing when one considers Middletown's population of only 30,000.

Y. M. C. A. buildings, lodges, churches, civic centers, schools, political buildings—handsome representatives of each are present in numbers sufficient for a city three times the size of Middletown.

* * *

Chicago, Ill.

Modernism is the dominant idea in the metropolis of the central West. Chicago is comparatively young as cities go; nevertheless it seems to have a woman's fear of old age and old-fashioned dress.

Few cities anywhere can present so many business streets of such modern appearance. Noisy, crowded, bustling, dirty, Chicago's business district nevertheless presents an inspiring picture of up-to-the-minute ideas in dressing store windows, and in building construction.

As Exhibit A of Chicago's modernity we'd like to present the new La Salle-Wacker building, where Bill Grunow and his associates hold forth, and where R. Cooper, Jr., is now fixing up a suite of offices and a set of display rooms that promises to be one of the Seven Wonders of the Refrigeration Industry.

Externally, this building appears to be constructed of polished metal. The elevator foyers are all-metal, and were designed by an architect with cubistic tendencies. Everything glistens. Angles are the rule.

The new La Salle-Wacker building strives to create an impression. It does. Just what the impression is, we can't decide just now; but it's probably a combination of newness, brightness, bizarreness, and something else we might call uncomfortableness, if people wouldn't think us old-fashioned.

On Michigan avenue north of the bridge a string of modernistic shops runs up the avenue until the business district tapers off into a *haut ton* apartment section.

Books, objets d'art, rugs, women's clothes, men's clothes, radios, food, and transportation are merchandised through these shops with their metallic fronts and angular trimmings.

They are indeed striking, and are as clean and face-slapping as the stiff breeze which blows upon them from adjacent Lake Michigan.

West and south of the main business district, structures are not so crisp and new. Rickety tenements, old stone-front apartments, garishly painted business houses.

If one goes far enough south, one runs through refreshing Jackson Park, with its collection of old World's Fair buildings, the University of Chicago, with its cathedral-like halls and its long turf-carpeted Midway.

No matter what or how much the visitor to the Stock Yards expected to see, he is probably surprised by the area covered. One enters a set of gates, drives up to and upon a trestle, and rolls interminably upon this elevated structure before reaching the heart of the yards.

Underneath the trestle are acres and acres of pens and corrals, where beef, pork and veal on the hoof are huddled together to spend their last days in motionless bewilderment.

At a center of all these pens is a group of dingy brick structures—offices, slaughter houses, packing and distributing buildings.

Intermingled indiscriminately together are buildings designated as belonging to Swift & Armour, Libby, Morris, and a few "independents."

It appears to be one big community enterprise.

A PAGE FOR HOME SERVICE WOMEN

COMPLETE DINNER MENU SUGGESTED

By Marion F. Sawyer
Kelvinator Home Economics Department

REFRIGERATOR menus will help the housewife in planning and preparing meals ahead of time, so that she may give her entire attention to the entertainment of her guests. The following menu and recipes were developed in the Kelvin Kitchen:

Dinner

Frozen crabmeat cocktail
Wafers
Grilled "quick-frozen" T-bone Steak
Buttered broccoli Mashed potatoes
Rolls
Cranberry ring salad
Cheese straws
Chocolate ice cream
Coffee

Frozen Crab Meat Cocktail

1 cup flaked crabmeat
1 teaspoon gelatine
2 tablespoons cold water
4 tablespoons tomato Catsup
Paprika
1 tablespoon lemon juice
1 tablespoon Worcestershire sauce
4 teaspoons French dressing
Salt

Soak gelatine in cold water and dissolve over hot water. Add catsup, lemon juice, other seasonings and fish. Turn into freezing trays, or place in paper cups in trays and freeze. Freezes in three or four hours. Serves four to six.

Grilled "Quick-Frozen" T-Bone Steak

Quick-frozen meats may be stored in the frost chest for an extended length of time. They may be thawed before cooking, or may be taken directly from the refrigerator and placed on the range. This second method is favored in most cases. Quick-frozen meats are cooked exactly the same as any fresh meats.

Cranberry Ring Salad

2 pounds cranberries
1 quart water
4 cups sugar
Celery and apple salad
Mayonnaise
Lettuce

Cook together the cranberries and water, until the cranberries are soft throughout. Rub through a sieve, add four cups of sugar and cook until the sugar is completely dissolved. Pour into a large ring mold, and place in refrigerator until firm. Unmold by dipping carefully into a large panful of warm water.

Then place chop plate over mold and reverse. Fill the center with diced celery and red apples, diced with the skin left on, tossed together with mayonnaise. Decorate with green cherries and lettuce leaves.

Chocolate Ice Cream

1 cup evaporated milk and 1 cup water or 2 cups sweet milk
2 tablespoons cornstarch
1 cup sugar
2 oz. unsweetened chocolate
2 egg yolks
1 teaspoon vanilla
1 cup cream

Scald milk or evaporated milk and water in top of double boiler. Combine cornstarch and sugar and add to scalded milk. Cook ten minutes. Add hot mixture to slightly beaten egg yolks, add melted chocolate, then return to double boiler and cook till thick and chocolate is all dissolved—about five minutes.

Cool, add vanilla, and fold in cream which has been whipped until it holds its shape, but no longer. Turn into tray and freeze for two or three hours. Fills one 27-cube tray.

RABBIT PIES PAVE WAY FOR FOOD SHOP

Canton, Ohio—When the chef of an exclusive city club found that the wives of members were always coming into his kitchen, asking him to make one of his rabbit pies or a dozen of his stuffed crabs for them, he resigned his job and started the Canton Food Shop, where he sells his own concoctions and keeps them fresh and sweet in a P L 17 General Electric refrigerator.

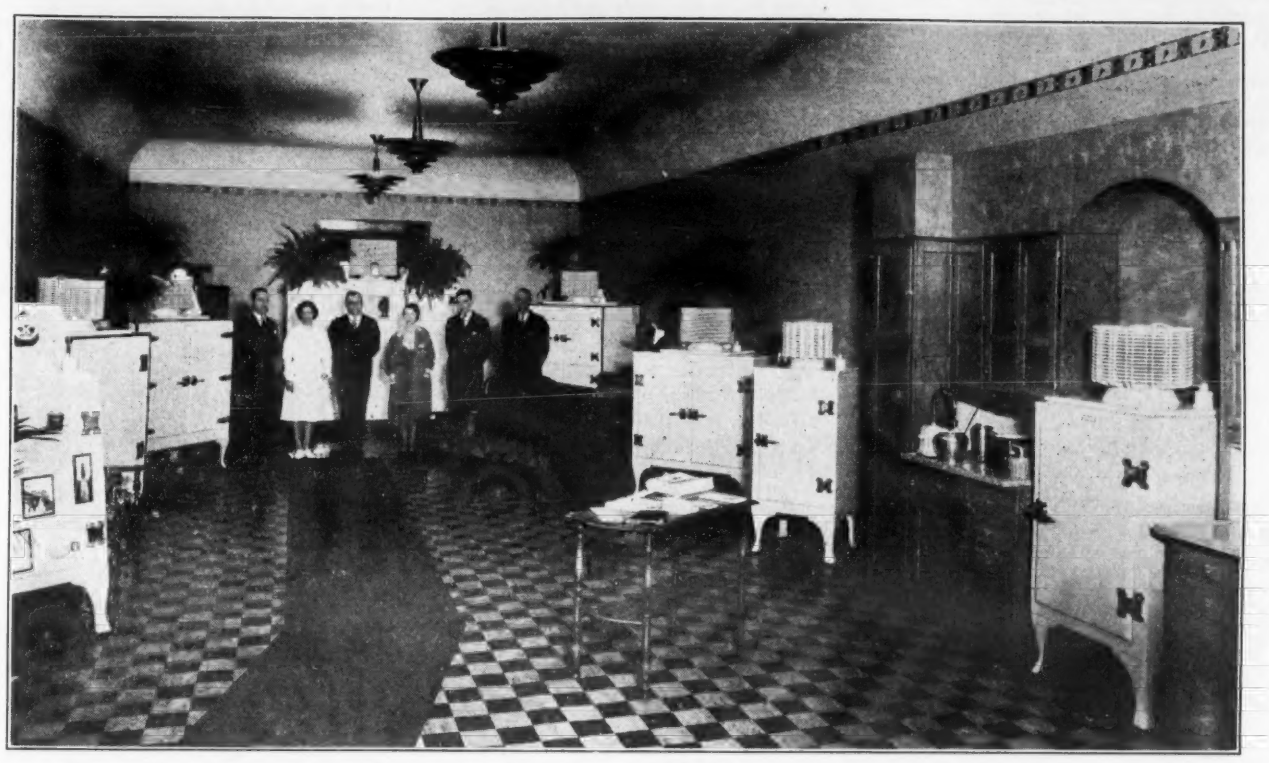
REMODELED APARTMENT HOTEL EQUIPPED

Kansas City, Mo.—Each of the seventy-one apartments in the remodeled St. Regis Hotel here has been equipped with Kelvinators. G. N. Paris landed the order for the Western Kelvinator Co.

The Kelvinators are built in as part of the kitchen equipment. Six WR-20 units in the basement handle the system.

The St. Regis apartment hotel is remodeled from the old St. Regis family hotel.

Frozen Deserts Score at Formal Opening



During the formal opening of the new Caswell-Stull branch store at Flint, Mich., Mrs. Helen M. Kyle, home economics director at the company's headquarters in Detroit, demonstrated the preparation of frozen dishes in the General Electric and the many uses the refrigerator has in the home.

Pictured in the photo are: (left to right)—W. J. Potter, salesman; Mrs. Helen M. Kyle, of Detroit, home economics director; Nelson McIntyre, store manager; Helen M. Cheney, secretary; W. J. Richter and Harry M. Siedschlag, salesmen.

APPLE DELIGHTS

Apple Muffins

Two tablespoons shortening, one cup bran flour, one-fourth cup brown sugar, or honey, one egg, one cup sour milk, one cup flour, one-half teaspoon soda, one-half teaspoon salt, one teaspoon baking powder.

Cream shortening and sweetening together. Mix and sift flour, soda, salt, and baking powder. Add the bran flour and milk alternately with the sifted dry ingredients. Pour into greased muffin tins and on top of each muffin place three thin slices of apple. Bake in moderate oven (370° F.) for twenty minutes. Yield, twelve medium-sized muffins.

Filled Heart Cookies

Take any cookie mixture which can be rolled thin; cut in heart shapes, place baked or cooked apple in center of heart, placing another heart-shaped piece of dough on top.

Press edges and bake twenty minutes in moderate oven (324° F.). These delicious apple-filled heart cookies are nice to serve with frozen apple sauce whip.

Frozen Apple Sauce Whip

One cup apple sauce, juice of one lemon, juice of one orange, one-half cup chopped nuts, one and three-fourths cups cream, pinch of salt.

Add nuts and salt to apple sauce and chill thoroughly. Whip chilled cream very stiff and add lemon and orange juice; combine with apple sauce mixture. Place in molds of assorted shapes and freeze in refrigerator tray.

Candied Apples

Core, pare and cut into one-half inch slices medium-sized apples. When apples are sliced they should look like a doughnut. Drop a few at a time into the syrup made of two cups sugar and one-half cup water. Simmer until clear. Drain on a plate.

Dry a few hours, then roll in granulated sugar. Let stand over night, then roll in granulated sugar. Repeat this process until they will absorb no more sugar, then pack in boxes lined with oiled paper.

Apple Logs

One-half cup shortening, one-half cup honey, two egg yolks, blend until mixture is clear and plastic, and add three-fourths cup white flour and three-fourts cup graham flour. Roll dough into strip five inches wide.

Blend cooked or baked apple with nuts (one part of nuts to two parts fruit). Spread this mixture in a one-half inch strip on the rolled cookie dough. Roll to form log, cut and form second roll, etc. This makes logs about three-fourths inches in diameter and about five inches long.

Bake in moderate oven (350° F.) about fifteen minutes. The logs can be cut in half, sliced, or in any size desired.

GINTY SELLS WINNER

St. Petersburg, Fla.—J. M. Ginty, of the Pinellas Electric Refrigeration Co., sold a model CS-601 General Electric commercial refrigerator recently to the Winner Grocery of this city.

HOME ECONOMISTS TO MEET IN CHICAGO

Chicago — Home service representatives of utility companies will gather here, March 23-26, for the Second National Home Service Conference, which will be held at the Edgewater Beach Hotel.

The four-day conference is sponsored by the Home Service Subcommittee of the National Electric Light Association. Miss Ada Bessie Swan, of the Public Service Co. of New Jersey, will be in charge.

The first two days will be devoted to the presentation of information on electric refrigeration, lighting, cleaning, cooking, washing, ironing, water heating, etc. Methods of presenting this information to customers will also be taken up at these meetings.

Organization and operation of home service departments, both gas and electric, will be the main topics on the third day program.

The American Gas Association Home Service Committee will conduct a one-day meeting on March 26.

NEW HAVEN APARTMENT GETS EIGHT G. E.'S

New Haven, Conn.—Eight General Electric S-42 units have been installed in an apartment building on Main Street, West Haven, owned by James D. Kaufman, by Modern Home Utilities, Inc., 1102 Chapel St., General Electric dealers, according to Miss Anne Johnstone, assistant manager.

Building nation-wide demand for products dressed in lustrous **MONEL METAL**

EVERY refrigerating equipment manufacturer who uses Monel Metal in his product is not only cashing in on Monel Metal's remarkable properties... he is also getting the benefit of a hard-hitting Monel Metal advertising campaign.

Monel Metal advertising, appearing month after month, year after year, in the big circulation national magazines and trade papers, is steadily—surely—building country-wide acceptance for refrigerators, display cases, ice cream cabinets and similar equipment that wears the Monel Metal badge of distinction. It is constantly educating your prospects to the advantages of owning equipment that offers Monel Metal's rare combination of rust-immunity, corrosion-resistance, easy cleanability, chip-proof surface and enduring attractiveness.

Monel Metal advertising is doing a selling job for many leading refrigerating equipment manufacturers. It can do the same thing for you!

Why not adopt Monel Metal for your equipment and cash in on Monel Metal advertising?

INCO MONEL METAL

A HIGH NICKEL ALLOY
MONEL METAL
NICKEL ALLOYS LOOK BETTER LONGER

Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

HOW REFRIGERATED WATER AIDS HEALTH

By D. T. Hayward
Frigidaire Corp.

HOW many sides to a glass of water? This is an unusual question, but still it will be interesting to see just how many angles there are to the simple glass of water.

Water is really a fundamental necessity in the life of man. In order to understand just how fundamental water is to the human system, I would like to discuss the needs for water in our body. All of us remember the Irish Rebellion and how a certain patriot named MacSweeney went on a hunger fast. Records show that he lived some forty-eight days without any food. He lived altogether on water.

Now on the other hand, were any of us stranded in the middle of a desert he would die in a period of three days, because of lack of water. For this reason we certainly can say that water is even more important to life than food.

The first function of water in the human system is to act as a sustaining factor. By a sustaining factor, we mean that it maintains the body weight. Medical science tells us that two-thirds of a man's weight is water.

Now I weigh approximately 150 pounds. If I were dehydrated, that is, if all the water were extracted from my body, I would weigh exactly 50 pounds.

Just any of you picture yourselves without any water in your body. Every day the human body loses through its various channels of excretion from 10 to 12 glasses of water. If this water is not replaced every day it is detrimental to the human system.

Our Food Is Mostly Water

The food we eat is made up of a large quantity of water. The average person will consume about four glasses of water in the food that he eats. It is an established fact that the average person drinks about three or four glasses a day. This would leave us shy from two to four glasses of water every day.

How long could you continue this? Here's probably what would happen: Over a period of time you would begin to feel run down, both mentally and physically. You would go to your doctor and say, "Doctor, I feel pretty well shot. I'm not exactly sick, but I'm always tired. I do not have the pep, I don't have the enthusiasm that I used to have. I am just as worn out in the morning as I was the night before. What's the matter with me?"

The doctor will look you over carefully and make a complete investigation and he will finally end up by giving you a package of pills or a bottle of medicine, and telling you to take one pill or one teaspoon of medicine each hour with—what? *With a glass of water.*

No doubt you are on friendly terms with one or two doctors. Ask them for your own information how many cases of sickness could be prevented if people would drink enough water. If they are frank and will tell you the truth, their answer will be: from 80 to 90 per cent.

The reason why this proper amount of water is necessary is because the principal organs of the body are made up chiefly of water. For example: The brain is 76% water, the heart and the nerves and muscles are 77% water. The blood serum is 90% water.

These are the organs within your body that enable you to function efficiently. If that were the only use for water in the human system, water would be just as important to you as it is today.

Water Necessary to Digestion

However, water is also necessary in order to aid digestion. The process of digestion, of course, is to take the food you eat and dissolve it so that it can be absorbed by the blood and then through the body.

Digestion is carried on by a number of digestive juices, namely: saliva, gastric juice and pancreatic juice. Unless these juices function properly there is no digestion or poor digestion. No digestion means that you get no nourishment from your food. Poor digestion means indigestion.

It is interesting to note that these digestive juices are 98% water, and unless they have the proper water content you do not get the best digestion.

So if the only uses for water in the body were to maintain body weight and to aid digestion, we could not stress too much the importance of water.

But there is a third and equally important use for water. That is aiding elimination. The chief agent of elimination is water.

The need of the human body for water is greater in the winter than summer. The fact that there is universally more sickness in the winter is significant of this need for water, the most efficient medicine known for carrying poisons out of the system.

Physicians point out that during the winter months individuals eat more and heavier foods to supply heat to the body; the digestive tracts are more apt to be heavily loaded, and the human system needs more frequent and thorough flushing.

Individuals dress warmer, yet perspire less, making it necessary to stimulate the flow of poison through the pores by drinking an abundance of water. Individuals are confined to less exercise and the dry atmosphere of artificial heat. An abundance of water in the system keeps the pores open and insures the vitality and softness of the skin.

Water at just the right temperature is even more essential in the winter than summer, because thirst is not so apparent, but the need for water is greater. One enjoys a drink of 50 degree water from an electrically refrigerated cooler on a cold zero day, while water from an iced cooler, which might be at 38 degrees, is neither palatable or healthful.

Offices are heated in winter months to temperatures equivalent to summer heat. This results in city tap temperatures too warm to be palatable. Where bottled water is used the water assumes the same temperature as the room, and cooling is necessary to produce a palatable drink.

If you go to the faucet and take a drink of city water in the summer time or in a heated office building, in all probability the water is too warm, and what do you do? You fill up the glass, take a small drink of the water and throw the rest away. People simply will not drink warm water.

On the other hand, you have a cooler which is filled with ice. Ice will cool water down to a temperature of nearly 30 degrees. Water at this temperature is entirely too cold. A person drinking a glass of water at approximately 40 degrees cannot drink sufficient quantities. The water quenches your thirst so rapidly that you do not drink as much water as your system needs.

Medical science has carried on years of experimentation to find out at just what temperature drinking water should be furnished, so people would drink the right amount without any unnecessary effort. The result of these experiments proved that 50 degrees is the ideal temperature for drinking water. At 50 degrees the water is cool and palatable, and you unconsciously will drink more water when it is at this temperature.

To prove this theory, let us cite the Charles E. Hires Co., of Philadelphia, which sells and leases Frigidaire water coolers. In the past this concern rented ice-cooled water coolers. It also sells purified water. The Hires company states that in every case where they have replaced an ice cooler with a Frigidaire water cooler they have sold from 30% to 50% more water to that customer.

This simply proves that the same people in the office will drink more water if it is at the right temperature than they will if it is not.

CENSUS REVEALS FOOD DISTRIBUTION STATISTICS

INTERESTING figures reported by the Bureau of Census, U. S. Department of Commerce, in its 1930 Census of Distribution of a number of cities, are summarized by the American Institute of Food Distribution.

Table I shows the 1930 population of each of the cities, the total number of stores selling food products at retail, their total sales, and the part that total makes in the total retail business of the city. The rank of food sales shows its importance based on volume compared with other commodity groups. The number of restaurants and other eating places is given with the total sales for this group and the percentage this makes of the total retail volume of the city. Sales and percentage figures cover only food sold through food stores; they do not include food sold through other types of establishments, such as department stores, 10c stores, etc. The average per store, per capita sales in all food stores and per capita sales in eating places are computations based on the census figures.

Table II shows the number of stores in seven major types of retail food outlets, their total sales and the computed average sales per store. Where the returns show the number of stores in a city but do not give the total sales, the number of stores is not used in calculating an average.

Table III gives the number of independent stores, national and sectional chain units in that city, and the total stores operated as local chains with total sales for each group and the average sales per store.

Census returns do not give this breakdown for cities of less than 30,000 population.

TABLE I

City	Population (1930)	All Food Stores: Number of Stores	All Food Stores: Total Sales	All Food Stores: % of Sales in Food Stores to Total Retail Sales	Rank of Food Compared with Other Commodity Groups	Restaurants and Eating Places: Number of Stores	Restaurants and Eating Places: Total Sales	Restaurants and Eating Places: Average Per Store	Restaurants and Eating Places: % of Restaurant Sales to Total Retail Sales	Per Cap Sales: All Food Stores	Per Cap Sales: Eating Places
Los Angeles, Calif.	1,238,048	5,228	$141,910,188	14.72	3	2,185	$109,729,031	$50,219	11.38	$115	$89
Oakland, Calif.	284,063	1,767	51,813,450	25.34	1	565	10,362,293	18,340	5.07	182	36
San Diego, Calif.	147,995	722	18,438,644	19.53	2	266	5,694,490	21,408	6.03	125	38
Portland, Ore.	301,890	1,628	43,841,042	20.70	2	568	12,060,534	21,233	5.70	145	40
Berkeley, Calif.	81,543	422	9,985,500	30.93	1	100	2,145,492	21,455	6.65	122	26
Glendale, Calif.	62,736	269	9,172,388	25.38	2	99	1,242,938	12,555	3.44	146	20
Oak Park, Ill.	63,982	193	11,053,665	34.99	1	30	944,257	31,475	2.99	173	15
Decatur, Ill.	57,510	305	8,856,395	26.85	1	78	1,280,553	16,417	3.88	154	22
Fresno, Calif.	52,513	463	9,558,448	18.03	2	136	2,425,329	17,833	4.58	182	46
East St. Louis, Ill.	74,347	411	9,540,869	28.82	1	113	1,231,540	10,899	3.72	128	17
Total, all others[1]	750,463	3,301	107,395,622	22.53		1,196[2]	21,063,982[2]	17,612	4.42	147	28

TABLE II

City	Grocery: Number of Stores	Grocery: Total Sales	Grocery: Average Per Store	Grocery and Meat: Number of Stores	Grocery and Meat: Total Sales	Grocery and Meat: Average Per Store	Meat Markets: Number of Stores	Meat Markets: Total Sales	Meat Markets: Average Per Store
Los Angeles, Calif.	2,015	$47,144,948	$23,397	1,006	$44,004,031	$43,742	895	$20,079,808	$22,436
Oakland, Calif.	883	19,090,764	21,620	190	15,935,643	83,872	237	9,329,669	39,366
San Diego, Calif.	358	8,743,061	24,422	101	2,721,596	26,946	121	3,569,087	29,497
Portland, Ore.	791	17,390,508	21,985	213	9,351,589	43,904	254	10,290,074	40,512
Berkeley, Calif.	190	5,569,312	29,312	18	1,264,136	70,230	51	1,875,693	36,778
Glendale, Calif.	78	2,180,158	27,951	51	3,122,504	61,226	52	1,145,744	22,034
Oak Park, Ill.	64	2,928,257	45,754	10	816,643	81,664	48	2,089,263	43,526
Decatur, Ill.	82	2,449,682	29,874	143	3,704,513	25,906	33	1,355,559	41,078
Fresno, Calif.	162	4,266,679	26,338	51	2,085,098	40,884	68	1,612,188	23,709
East St. Louis, Ill.	35	974,460	27,842	217	5,941,060	27,378	40	1,327,640	33,191
Total, all others[1]	1,332	36,080,823	27,088	802[3]	36,423,760[3]	45,416	454[4]	19,140,064[4]	42,159

TABLE II—(Cont'd)

City	Confectionery: Number of Stores	Confectionery: Total Sales	Confectionery: Average Per Store	Dairy, Eggs and Poultry: Number of Stores	Dairy, Eggs and Poultry: Total Sales	Dairy, Eggs and Poultry: Average Per Store	Fruits and Vegetables: Number of Stores	Fruits and Vegetables: Total Sales	Fruits and Vegetables: Average Per Store	Delicatessen: Number of Stores	Delicatessen: Total Sales	Delicatessen: Average Per Store
Los Angeles, Calif.	449	$4,510,165	$10,045	129	$9,953,378	$77,158	413	$7,581,957	$18,358	86	$2,737,898	$31,836
Oakland, Calif.	29	657,854	22,685	280	3,681,934	13,150	22	414,940	18,861	43	1,451,789	33,762
San Diego, Calif.	54	716,271	13,264	15	1,379,781	91,985	48	718,469	14,968	9	240,065	26,674
Portland, Ore.	163	1,668,068	10,234	26	1,733,376	66,668	89	1,051,893	11,819	18	350,871	19,493
Berkeley, Calif.	31	351,837	11,350	8	121,840	15,230	24	603,586	25,149	11	110,137	10,013
Glendale, Calif.	14	162,760	11,626	11	1,100,271	100,025	36	1,075,864	29,885	2	*	*
Oak Park, Ill.	22	288,987	13,136	*	*	*	19	285,248	15,013	27	444,159	16,450
Decatur, Ill.	24	388,980	16,207	12	729,072	60,756	3	50,936	16,979	1	*	*
Fresno, Calif.	39	424,219	10,877	20	340,008	17,000	90	349,051	3,878	5	153,792	30,758
East St. Louis, Ill.	106	432,936	4,084	3	147,411	49,137	2	*	*	1	*	*
Total, all others	300[5]	3,843,511[5]	12,812	47[6]	2,227,565[6]	47,395	90[7]	1,746,356[7]	19,404	50[10]	425,602[10]	8,512

TABLE III

City	Independent Stores: Number of Stores	Independent Stores: Total Sales	Independent Stores: Average Per Store	National and Sectional Chains: Number of Stores	National and Sectional Chains: Total Sales	National and Sectional Chains: Average Per Store	Local Chains: Number of Stores	Local Chains: Total Sales	Local Chains: Average Per Store
Los Angeles, Calif.	2,226	$43,299,099	$19,496	519	$26,890,959	$51,813	276	$20,958,921	$75,938
Oakland, Calif.	738	11,588,919	15,703	292	21,224,315	72,686	42	2,178,907	51,879
San Diego, Calif.	371	7,135,054	19,232	51	2,268,080	44,472	37	2,061,523	55,717
Portland, Ore.	768	16,459,653	21,432	147	6,571,644	44,705	89	3,710,800	41,694
Berkeley, Calif.	146	3,624,839	24,828	42	2,521,042	60,025	20	687,567	34,378
Glendale, Calif.	71	1,748,072	24,621	35	1,608,799	45,966	23	1,945,791	84,600
Oak Park, Ill.	23	856,686	37,247	45	2,401,263	53,361	6	486,951	81,158
Decatur, Ill.	179	3,783,051	21,134	27	1,366,352	50,606	19	1,004,792	52,884
Fresno, Calif.	163	2,977,208	18,265	33	1,545,962	46,847	17	1,828,607	107,565
East St. Louis, Ill.	215	4,660,138	21,675	24	1,171,713	48,821	13	1,083,669	83,359
Total, all others	658[8]	15,648,119[8]	23,781	46[9]	3,133,661[9]	68,123	39[9]	3,015,346[9]	77,317

*Not given separately.

[1] Includes: Bakersfield, Brawley, Burbank, Fullerton, Monrovia, Ontario, Redlands, Richmond, Riverside, Salinas, San Bernardino, San Leandro, Santa Cruz, Santa Monica, Santa Rosa, South Pasadena, Stockton, and Whittier, California; Aberdeen, Washington; Medford, Oregon; Missoula, Montana; Roswell, New Mexico; Alton, Calumet City, Elgin, Elmwood Park, Forest Park, Freeport, Harvey, Harrisburg, La Grange, La Salle, Mattoon, Melrose Park, Moline, Ottawa, Park Ridge, Streator, and Wilmette, Illinois; Ann Arbor, Menominee, and Sault Ste. Marie, Michigan.

[2] Does not include: Elmwood Park, Illinois—two eating places, sales not given.

[3] Does not include: Medford, Oregon; and Menominee, Michigan.

[4] Does not include: Calumet City, Elmwood Park, Melrose Park, and Park Ridge, Illinois; and Menominee, Michigan.

[5] Does not include: Burbank, Monrovia, Ontario, Redlands, and Santa Cruz, California; and Harrisburg, Illinois.

[6] Includes only: Riverside, San Leandro, Santa Cruz, Santa Monica, Santa Rosa, Stockton, and Whittier, California; Aberdeen, Washington; Elgin, Moline, and Streator, Illinois.

[7] Includes only: Bakersfield, Burbank, Monrovia, Ontario, Richmond, Riverside, San Berdandino, Santa Monica, South Pasadena, Stockton, and Whittier, California; Alton, Elgin, Forest Park, Harvey, and Wilmette, Illinois.

[8] Includes only: Riverside, San Berdandino, Santa Monica, and Stockton, California; Alton, Elgin, and Moline, Illinois.

[9] Includes only: Riverside, San Bernadino, and Santa Monica, California; Alton and Moline, Illinois.

[10] Includes only: Santa Monica, California; Forest Park, Harvey, Melrose Park, and Park Ridge, Illinois.

KELVINATOR TRIES FROZEN FOOD CASES

By E. H. Wilcox
Associate Export Manager,
Kelvinator Corp.

OF the many developments that are taking place in the refrigeration world, the most noticeable of the past year concerns the perfection of the sharp-freezing of perishable products. Fish, meat, and even vegetables are quickly frozen at temperatures well below zero.

This quick-freezing prevents the breaking down of the tiny elastic walled cells filled with jelly-like fluid, containing, in solution, various salts. The prevention of the breaking down of cell walls results in the flavor of the products not deteriorating, even when kept over a long period of time.

While the process of sharp-freezing has been developed to a high degree, the real problem concerns the distribution of these frozen products; they must be kept at temperatures preferably ranging from 4° to 8° F.

If carried over for any length of time at higher temperatures, there is a tendency on the part of the tiny cells to break down and the flavor of the product is affected.

The three principal builders of mechanical refrigeration equipment in the United States are spending a great deal of time and effort in their engineering and research laboratories to develop a case which will prove satisfactory under all conditions.

Many builders have turned to the standard display case and attempted to adapt that to the peculiar requirements of quick-frozen products.

The low temperatures required bring about many problems, which make it impossible to use a standard display case with any degree of success; and the tendency now is to develop a special line of equipment which will be suitable for use in connection with the handling of sharp-frozen products only.

It is quite probable that the ultimate case will have separate display and storage sections. The display will be used for display purposes only and the food stocks will be stored in a separate section.

The Kelvinator Corp. has always made it a policy to thoroughly try out all equipment before marketing abroad. Due to the peculiar new problems involved in quick-freezing, we feel that it will be at least a year before we can feel safe in recommending equipment for our customers abroad.

I have mentioned this new development of quick-freezing, as it goes to show how rapidly new ideas are developing which ever widen the scope for electric refrigeration.

I was rather surprised to notice the absence of drinking water cooling equipment in your public buildings and offices. Mechanical refrigeration is extensively used for this purpose abroad and I feel that the development of this field will well repay the various companies interested in the sale of electric refrigeration equipment in Australia.

There is a future in Australia for refrigeration products if they can be supplied to the public at a cost which is not excessive." — *Refrigeration, Cold Storage, and Air-Conditioning.*

Grocery Opens Frozen Meat Department

Packaged meats on display in Keokuk, Iowa, grocery.

* * *

IOWA STORE NOW SELLS SWIFT'S FROZEN MEATS

Keokuk, Iowa — Quick-frozen meats, supplied by the Swift & Co. branch at St. Joseph, Mo., are now being sold in this city by C. M. Laubersheimer, who operates a grocery at 517 Main St.

In his newly established frozen meat department, Mr. Laubersheimer has a Mills freezer case cooled by Keokuk refrigerating equipment. Frozen meats, such as roasts, pork and lamb chops, beef tenderloin, sweetbreads and calves liver, are all being handled by the new department.

Representatives of the Swift branch were on hand at the opening to explain to customers the quick-freezing of meat products.

The equipment supplied by the Keokuk Refrigerating Co. for maintaining low temperatures in the Mills case consists of two direct expansion fin type coils running full length of the case and equipped with one American Radiator thermostatically controlled valve. The Keokuk compressor is a type B, 1½ h.p., two cylinder, air-cooled model, with multiple V-belt drive. It is controlled by a Penn type L pressure switch.

KROGER FOOD STORES TO SELL MEALS, BEVERAGES

(Concluded from Page 1, Column 2)

record which was 12 times that of the average sales of regular Kroger stores. Average sales per Kroger store in 1930 were $51,700.

Further opportunity for expansion lies in overtures made by Montgomery-Ward officials for similar units to be placed in its general stores, which have discontinued food merchandising.

Although President Morrill indicates that expansion in this direction is a possibility, no steps have been taken as yet toward an agreement with Montgomery-Ward executives.

Ohio Meat Retailing Statistics

RETAIL sales in twenty-six cities in Ohio reported in the 1930 Census of Distribution total $248,000,000, of which approximately one-fourth was spent for food. The tabulation below shows the number of grocery stores with meat departments and the number of meat markets in each city. Sales for both types of stores are also included.

	Total food sales.	Grocery stores with meat departments. No.	Sales.	Meat markets.. No.	Sales.
Alliance	$3,213,106	44	$1,405,223	13	$ 495,161
Ashland	1,865,617	9	490,488	7	188,930
Ashtabula	3,690,091	30	1,259,872	17	581,128
Barberton	3,137,803	25	875,676	33	1,160,875
Bellaire	1,492,788	22	472,044	11	443,165
Coshocton	1,332,881	14	507,325	4	128,316
Cuyahoga Falls	2,018,185	40	1,271,629	7	281,008
Liverpool	3,076,650	20	889,595	16	642,961
Findlay	2,239,608	21	700,575	11	470,168
Fostoria	1,409,690	11	555,598	5	287,711
Fremont	2,081,609	24	1,005,097	7	251,470
Ironton	1,881,255	22	685,559	20	351,136
Lancaster	2,577,524	38	990,253	20	490,532
Lima	4,914,315	109	3,423,302	14	264,556
Marietta	2,223,811	7	180,954	16	614,533
Martins Ferry	1,533,295	17	554,306	5	341,900
Massillon	4,565,929	45	1,815,596	10	778,346
New Philadelphia	1,569,902	21	479,642	9	247,720
Niles	2,177,312	37	1,030,351	7	507,633
Painesville	1,623,720	20	973,835	3	190,000
Salem	1,706,200	14	881,910	4	239,590
Sandusky	3,615,137	20	849,276	20	953,943
Struthers	1,045,082	14	745,713	..	.....
Tiffin	2,091,366	17	613,901	10	446,851
Wooster	2,681,263	12	373,719	7	422,514
Xenia	1,739,686	29	734,430	8	170,860

RESTAURANT BUYS EXPENSIVE SYSTEM

Los Angeles—Kelvinator Los Angeles Co. has just completed the installation of refrigeration equipment in the new Supreme Cafe, South Broadway, owned by The May Co. Department Store of this city.

The equipment in this restaurant, approximating $2,500, includes four WR-40 water-cooled units, and a large walk-in box in the kitchen. The soda fountain and cold tables also have been equipped.

Another installation recently completed by this company was placed in Gumbiner's new Los Angeles Theatre, South Broadway.

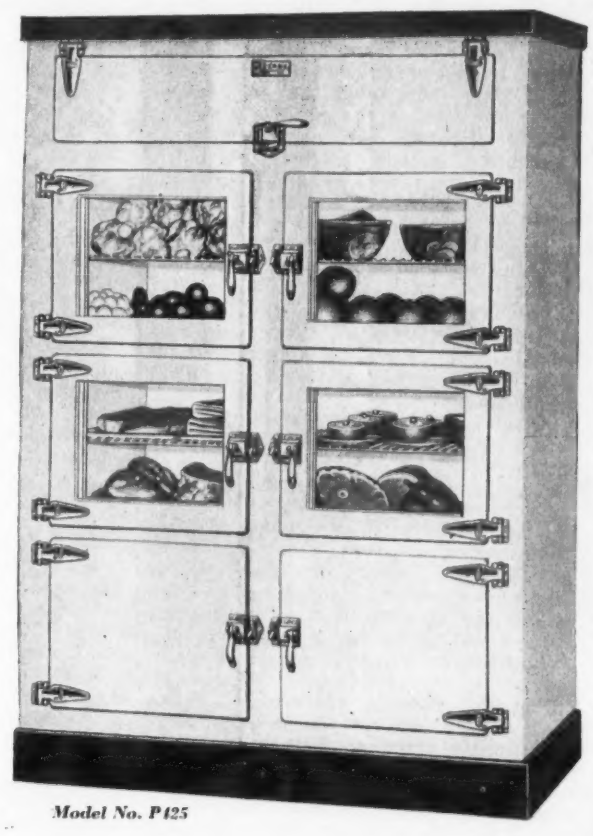
Two levels below the street floor in this $2,000,000 picture house is the fountain room and restaurant equipped with Kelvinators.

The theatre water cooling system consists of one 200-gallon storage type cooler, built of heavy steel and installed with coils. It is cooled by a heavy duty Kelvinator WR-41 compressor.

Water is circulated to different parts of the theatre through cork insulated lines.

. . For machine refrigeration of any type, McCray offers a complete line of commercial cabinets backed by 41 years' experience in building highest quality equipment for every refrigerator need . . .

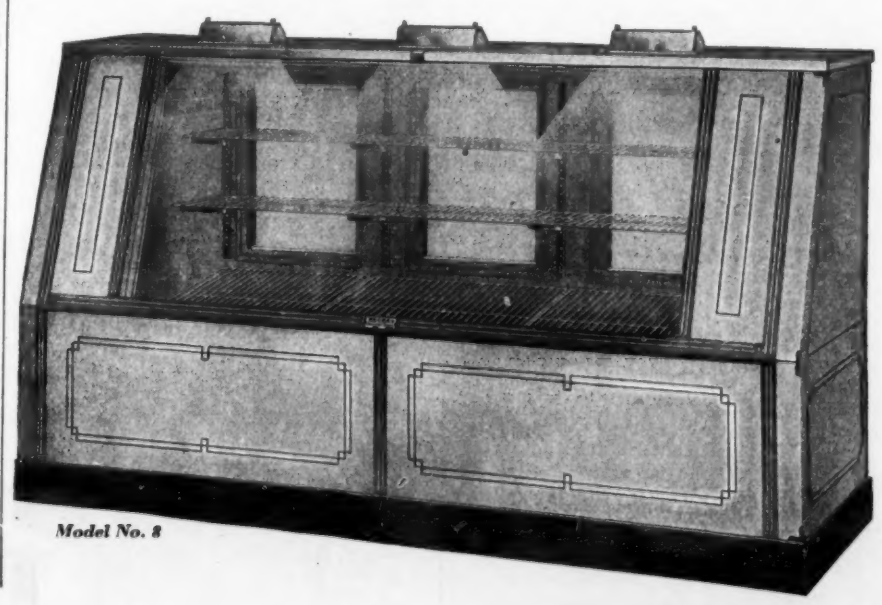
The storage model No. P425, illustrated here, is typical of McCray in-built quality. Exterior and interior are of gleaming white porcelain. Four-inch walls have three inches pure corkboard. Three thicknesses of glass in display doors — nickeled bronze hardware . . . .



Model No. P425

McCRAY

refrigerators are built to a standard of construction which has meant satisfactory and enduring service for 41 years. With McCray, the dealer in mechanical refrigeration of any type is assured of the most efficient and economical operation of his installation.



Model No. 8

At left is shown the new McCray model No. 8—a display case refrigerator for delicatessen use. Exterior of white porcelain with Monel metal trim and black base. Display front three courses plate glass. Ample storage space below.

All McCray models may be used with machine refrigeration—no changes necessary. Dealers should write now for facts of complete McCray line—no obligation.

McCray Refrigerator Sales Corporation, Dept. 66, Kendallville, Ind. Salesrooms in All Principal Cities. (See Telephone Directory)

MIDDLETOWN STORES ARE WELL EQUIPPED

(*Concluded from Page 1, Column 1*)

ation equipment. A York refrigerating machine cools three Cincinnati "Beauty" cases and two walk-in coolers in this installation.

Another York machine has been in use for the last five years at the Mayer Meat Co., where three Thesco (C. Schmidt) cabinets have been giving service equally long.

The proprietor says he has no refrigeration worries at all—forgets he has a system until somebody asks about it, he maintains.

At the Chicago Market Co. there are four Thesco display cases on duty. A Frick refrigerating machine has given trouble-free service for more than three years in this butcher shop.

Thesco cases—two of them—are used by the Reiner Bros. meat market. A York machine refrigerates both cases and a walk-in cooler as well.

Ice is used by one lone meat market, the L. J. Hess Market. This establishment has three Eskimo Freezer Display cabints, all refrigerated by ice.

The Boston Fish Market, a hole-in-the-wall market with fish on display, both in the window and in a flimsy show-case at the rear of its small room with sawdust floor, uses ice also.

Frigidaire equipment has been keeping foods cold at the Sanitary restaurant for three years. A commercial unit cools a large wooden refrigerator, and a Frigidaire ice cream cabinet is also in use.

At the De Luxe Lunch a Frigidaire commercial machine is hooked up with a cold-chest made by a Middletown carpenter.

Two Frigidaire machines have been operating efficiently at the Olympic restaurant for four years. Another Frigidaire is on duty at the Manchester hotel restaurant.

Harry's Cafe and the Home Restaurant both use ice refrigeration.

A second Kroger store has just been opened in Middletown. Unlike the first, this store handles meats. It has one display case with a Kroger name-plate on it, refrigerated by ice.

J. Ristaneo, an Italian-born grocery storekeeper, is more than glad to tell all comers how much fuss and bother he is saved by having a Frigidaire machine hooked up to his Leonard refrigerator.

For four years a Frick machine has been cooling two carpenter-made cabinets for the Quality Meats & Groceries shop here. The proprietors can't remember any service calls.

Frigidaire machines are connected to the soda fountains of the Sweetland confectionery, the Elite Soda Lunch, the Ideal confectionery, the Parrott confectionery, the Barbara Sweet Shop, E. J. Stevens' drug store, the Eureka confectionery, and the Delicia confectionery.

The last-named confectionery has three Frigidaires. One refrigerates a new Bishop & Babcock soda fountain, another cools a storage cabinet, and a third is attached to a Banta display case.

This display case is located immeditely in front of the section of the shop devoted to customers' tables. It contains salads and frozen desserts to tempt all those who must walk past it to get to the tables.

Nash Shop Meets Customer's Demand

(*Concluded from Page 1, Column 5*)

ren wall box. One of the display cases is a delicatessen cabinet, and is refrigerated by a ⅛ h. p. Copeland machine. Both the wall box and the low temperature case are refrigerated by a Copeland 1½ h. p. machine.

Thus far the entire cost of running and maintaining all his refrigeration equipment has not exceeded $15 a month. He keeps close to 1,000 pounds of meat and dairy products daily in his three cases.

The special wall box is built into a wall which divides the front merchandising section of his store from the rear storage section. It is barely shoulder high. In it he keeps the heavier cuts of meat.

In the basement of the store both refrigerating machines are located. At first they were installed in a position against one wall of the basement. Later the Copeland engineers discovered that they could speed up the defrosting cycle by placing the machines in the center of the floor, squarely underneath the cabinets.

Swift & Co. make deliveries of quick frozen meats to this suburban store within 24 hours after an order is placed.

During the winter months the shipments arrived unrefrigerated, but recently they have begun to come packed in solid carbon dioxide.

BRITISH GOVERNMENT MAY ENTER FOOD BUSINESS

(*Concluded from Page 1, Column 5*)

half of the $2,000,000 worth of food it consumes each year.

It is predicted that this measure might result in a production total increased so greatly that production would equal consumption.

Conservatives in the House, objecting to its compulsory nature, have protested its passage with considerable feeling.

LETTERS FROM READERS

Hurrah for Harvard

Philadelphia, Pa.

Editor:

In your remarks anent Boston in the February 25 issue of the Refrigerated Food section of ELECTRIC REFRIGERATION NEWS you referred to the screaming headlines of Boston newspapers, and commented that one would expect in Boston the sober, eight-column dignity of the "New York Times."

It is too bad that you did not see a copy of the "Boston Transcript" which is the most influential paper published in New England and regarded as one of the finest examples of conservative and constructive journalism in America.

It would be proper to say that the "Boston Transcript" compares favorably with the "Times" were it not more correct to say that the "New York Times" is not as old as the "Transcript" and rather less distinguished.

As for Cambridge being known only as the home of Harvard University, it should be also know that Cambridge is now the home of the Massachusetts Institute of Technology, where many of our greatest engineers—including the refrigerated variety—are hatched.

Although there may be no ivy-clad halls at Harvard there are ivy-clad walls. Further be it known that most of the great eastern universities have buildings which are built of brick, including Yale and the University of Pennsylvania, as well as Harvard.

Whether or not they are squat is a matter of opinion.

I think that the only skyscraper university in the United States is located in Pittsburgh.

As for the culture-bound young men and women, they differ from the Greenwich Village variety in that they seek the real thing. I might add that, unlike the Greenwich Village persuasion, they find in development of the intellect a bulwark of virtue, rather than making the alleged pursuit of culture a cloak and excuse for vice.

You guessed it—I was raised under the shadow of Bunker Hill.

H. W. DEARING,
Brown Instrument Co.

Z Coming to U. S. A.

Liverpool, England.

Editor:

I am planing to come again to your country and I intend leaving England on the 4th April with S. S. "Adriatic." I hope to be in New York in the middle of April.

My son will remain in England for some time yet. He is doing some valuable work, and is by now an expert in quick-freezing.

When coming to America (New York) I will take with me our commercial quick-frozen products, as samples of our work on the continent.

We have had several samples of Birdseye quick-frozen products, and I know the competition I will have. But I know one great advantage: we can quick-free with 50° F. *just as fast* as the other systems do with —45° F. In other words, given —45° F. I could quick-freeze still faster and simpler.

In several days' time I shall send you the further program of my voyage to the U. S. A.

I shall be glad if you inform your readers of my arrival to your country.

M. ZAROTSCHENZEFF.

Education

San Francisco.

Editor:

We enclose our check for $1 for payment of one year's subscription to Refrigerated Food Section. We appreciate very much your sending us copies of this paper for some time, and we have passed them among our customers until they are worn out.

Some time ago we wrote you and suggested that you send us a number of copies of each issue of the Refrigerated Food Section which we would distribute among our customers throughout the northwest, Honolulu, and other points. We are and have been doing this with other periodicals, folders and leaflets for some time.

We receive no pay for the distribution of these various advertising mediums but we believe in disseminating all the possible knowledge regarding refrigeration, handling and care of fish, and other matters of interest to our customers, as we believe they all have some educational value and that they will help our customers to bigger and better things.

If you care to send us additional copies each month we will see to it that they are distributed among our customers, and they will probably do some good and might result in additional subscribers for your paper, as has happened with other magazines we have distributed.

Austin M. Bentley,
Sales Manager, San Francisco International Fish Co.

TO HELP YOU MAKE MORE SALES

If you are a manufacturer, distributor, or dealer, you can use the *Refrigerated Food Section* as a definite aid in the promotion of commercial sales. Simply see that it reaches your commercial prospects.

In the *Refrigerated Food Section* will be found news and information of interest to meat merchants and grocers, chain store executives, ice cream manufacturers, druggists, confectioners, restaurant owners, and all food service establishments.

Your prospects will be better informed on the advantages of up-to-date refrigeration equipment by reading the *Refrigerated Food Section.*

Use the blank below to order extra copies for distribution by your salesmen. Or send to ELECTRIC REFRIGERATION NEWS the names of companies to which you would like to have sample copies sent.—Editor.

Order *for* Refrigerated Food Section

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☐ Send.....copies of Refrigerated Food Section for..... consecutive issues ($10 per hundred—10c per copy.)

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Send sample copies Refrigerated Food Section (no charge) to names given below.

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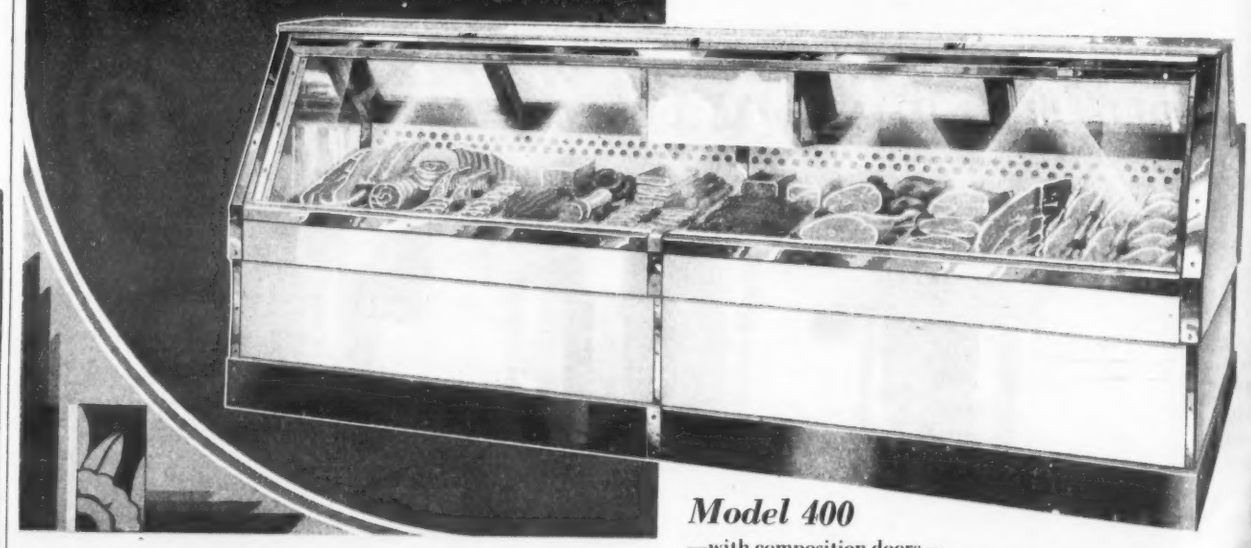
3-11-31

LOWEST PRICED METAL CASES *in* HILL'S HISTORY

Actual photograph of one of the many Hill installations in Pender's Stores, Norfolk, Va. Illustration shows 16 ft. No. 400 case and Hill stock cooler.

The HILL Dry-Cold



Model 400

—with composition doors—
porcelain exterior — adjustable rack, and new inside lighting arrangement.

Production made it possible to lower prices on Hill stock metal display cases. You are now able to get the best—and pay no more. Through continuous experimenting for improvements and better materials, the Hill showcases are even finer than ever before. They are designed and built for a value-conscious public, which now, more than ever before, expects a full measure of performance, appearance, and economy. Here is outstanding quality at the right price — write for more information.

C. V. HILL & CO. Inc.
Trenton, N. J.

Water Cooling Number

Engineering Section

In Three Parts Part Three

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office.

The business newspaper of the refrigeration industry

ISSUED EVERY TWO WEEKS
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TWO DOLLARS PER YEAR

RADIO-ACTIVATED WATER PRODUCED BY NEW COOLER

Health Properties Are Produced By Carnotite Ore Sleeves For Water Coolers

Detroit—Specially-constructed bottles for bottle water coolers, which give city tap water radio-active properties equal in health value to water of the well-known springs of the world, have been announced by L. L. Parrish, Detroit distributor of the Water Appliances Corp. of San Francisco, which is manufacturing the bottles. More than 500,000 unrefrigerated water jars have been sold by this company.

William Dorflinger, commercial sales manager of Caswell-Stull, Inc., Detroit G-E distributor, announces that this water bottle will be handled on the same plan as other spring waters.

"Water from the famous health resorts of Hot Springs, Ark., Saratoga Springs, N. Y., Bath, England, Vichy, France, and Baden-Baden, Germany, doesn't differ chemically from most city waters," Mr. Parrish said. "Its distinguishing feature is the presence as a colloid, of Niton gas which is emanated continuously to the water from radio-active ores which surround the water in the ground."

The same principle has been applied in the design of the new bottle. Carnotite ore, a radio-active substance, is mined in Paradox Valley, Utah, and

(Concluded on Page 2, Column 3)

WATER FILTRATION PROCESS DESCRIBED

By A. Zollo
Filtrine Manufacturing Co.

SINCE today's public demands the ultimate in sanitation and design, filters become a very important factor as accessory equipment for each pressure type electric water cooler installation.

In any drinking water equipment, the purity and clarity of the water dispensed is just as important as volume and temperature. If the water is not clear and attractive to drink, the best cooler has failed in its purpose. Filters, therefore, are the safety valves that insure the user's satisfaction.

It is agreed that the municipal water supply in the average community is free from harmful bacteria, and it must also be agreed that the water as it leaves the filtration and treatment plants of the average city water company is fairly clear. But as the water progresses from the point of treatment through miles of aged street mains, building plumbing, and house tanks, vegetable matter and attendant bacteria have grown and multiplied.

In addition to this growth, the water picks up from the piping and tanks, various assortments of iron and other suspended impurities. Some water supplies require the injection of chlorine and copper sulphate as a part of the purifying treatment. Overdoses of this treatment are often unvaoidable, imparting distinct taste and odor to the water.

From this it will be seen that filters are actually required, both from the viewpoint of the buyer and seller. Located immediately at the dispensing point, in order to remove all accumulation of suspended matter, and also to absorb and remove the odor and taste, they render the water as it leaves the cooler, pure, sparkling, and free from odor and taste.

There is another very important reason why pressure coolers should have filters. That is, the design and construc-

(Concluded on Page 3, Column 1)

FEDDERS ASSUMES DUTIES OF GENERAL MANAGER

Buffalo, N. Y.—L. H. Fedders, president of the Fedders Manufacturing Co., has taken over the duties of general manager also, with the recent resignation of H. M. Yaeger, former general manager of the company.

Servel Saves Money with Self-Tapping Screws

Evansville, Ind.—Assembly costs of Servel and Electrolux refrigerator cabinets have been reduced an estimated $64,000 a year on an anticipated production of 70,000 units, by the adoption of self-tapping sheet metal screws for fastening the exterior metal to the steel skeleton frame work. The savings in production costs were calculated by the A. C. Nielsen Co. of Chicago.

C. H. Tanger, assistant chief engineer of Servel, Inc., traced the manufacturing development which led up to the adoption of these screws, as follows:

The porcelain enameled sheet iron food compartments are first covered over on all outside surfaces with a layer of insulating material called the liner, and the assemblies at this stage are known as cores. These cores are completely enclosed in a thick outer layer of cork insulation in such a way that there can be no metallic contact between the core and the exterior of the finished cabinet.

The solid blocks, consisting of core and cork insulation, are then mounted on suitable bases and the next step in assembly is the application of the outside sheathing known as exterior metal. In our design, the exterior metal consists of a flat back member, a shallow tray-like stamping for the top, and a third piece which seals off the front (except for the door opening) and both of the sides.

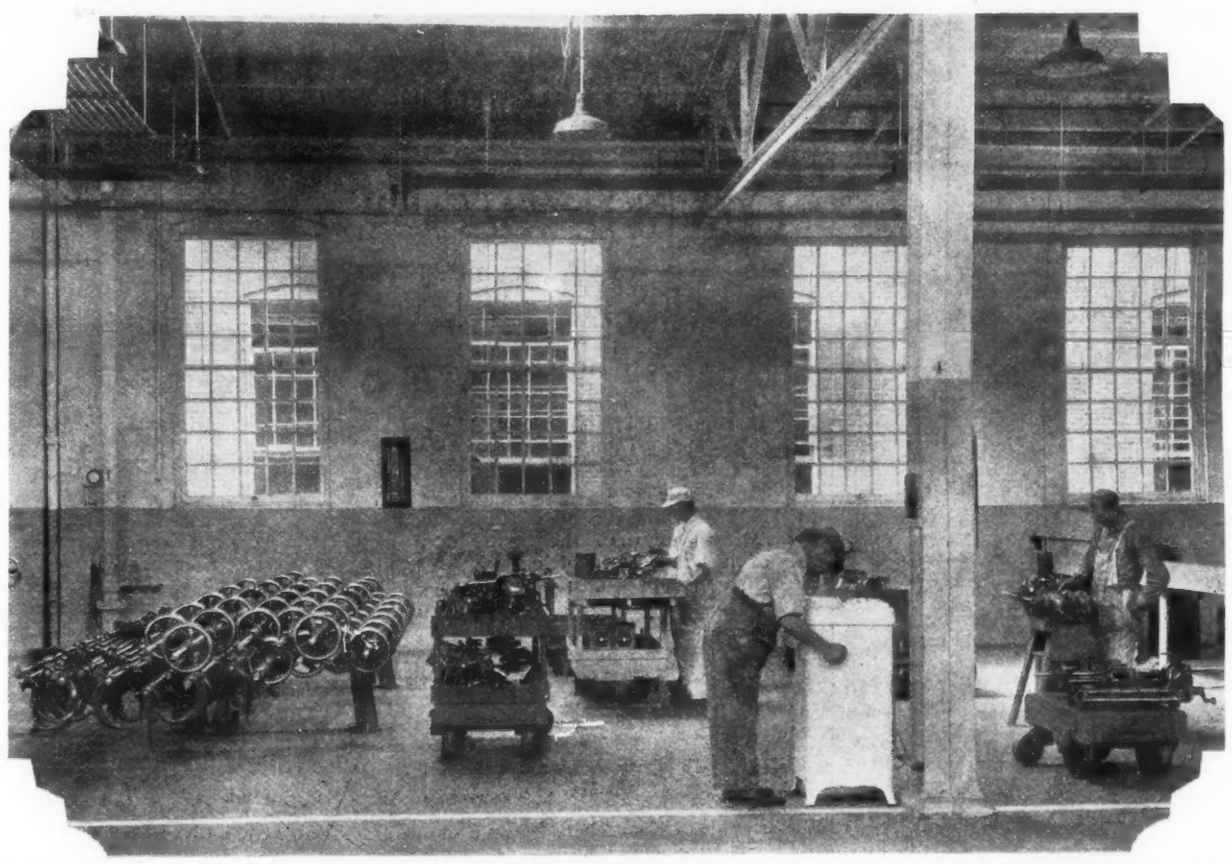
We consider it vital that these three sections of exterior metal be fastened firmly together along seams which occur on all four sides around the top, and along the two vertical edges at the rear where the backing sheet joins the sides. To achieve this, we first considered the use of bolts threaded either into ordinary nuts or into tapping plates welded to the inside surface of the innermost piece of exterior metal.

It was manifestly impossible to hold nuts in place by hand due to the totally enclosed construction, and, after due consideration, we decided that it would be prohibitively expensive to weld the nuts or tapping plates to the exterior metal.

As an alternative, the best then available, we adopted the practice of build-

(Concluded on Page 2, Column 1)

Water Coolers Popular in Factories



Workmen in the Textile Machine Works, Reading, Pa., quench their thirst at 100 G-E pressure water coolers

NEW COMPRESSORS, COILS DESIGNED BY FRIGIDAIRE

Dayton—Fourteen new coils and new compressors have been added to the Frigidaire commercial line, according to an announcement made last week. Eight of the new units are for liquid cooling and are of the cross fin type, while the other six are for refrigerator application.

"All air-cooled models are assembled with radiator type condensers," B. J. Vandoren, commercial sales manager said. "Water cooled compressors retain the same condensers with the additional feature of water-cooled valve plates."

All commercial compressor models except those used in ice cream cabinets have a high pressure cutout. One feature of the new commercial machines, Mr. Vandoren pointed out, is the automatic belt adjustment.

"Automatic defrosting is another feature of the new coils," he said. "The

(Concluded on Page 14, Column 2)

A. I. E. E. TO MEET

Pittsburgh — Inter-connected power lines, protective devices, and industrial power applications will comprise the majority of the discussion at the regional meeting of the American Institute of Electrical Engineers, March 11 to 13, here. A number of related subjects will also be treated. The papers to be presented at the five technical meetings follow:

Wednesday, March 11, Morning—"Burn-off Characteristics of Low-Voltage Network Cables," G. Sutherland and D. S. MacCorkle; "Arcs in Low-Voltage A.-C. Network Cables," J. Slepian and A. P. Strom; "Reignition of Metallic A.-C. Arcs in Air," S. S. Atwood, W. G. Dow and W. Krousnick. Afternoon—"Vertical Networks in Metropolitan Of-

(Concluded on Page 14, Column 2)

Cooling Systems Need Pipe Line, Tank Insulation

By E. C. Lloyd
Armstrong Cork & Insulation Co.

BOTH circulating and non-circulating types of water cooling systems need pipe line and tank insulation—the non-circulating system particularly since it depends to an even greater extent, than the circulating system, on insulation. Without insulation, standing water soon takes on heat from the surrounding air and becomes unpalatably warm; the natural result being that the drinker allows the fountain to run for a sufficient time to draw off the warm water in the line before starting to use the water. That this is a needless waste of time, refrigeration and water is obvious.

Actually, the first consideration in the use of insulation is the conservation of refrigeration. Incidentally, insulation by preventing condensation on lines and tanks, halts the deterioration of cold lines and tanks through rusting induced by condensation. In many instances insulation also prevents goods and fixture spoilage which might result if condensation were allowed to form and drop to the spaces beneath the insulated lines.

In addition to these two advantages, there is a direct saving in the amount of water used and wasted. The added

(Continued on Page 5, Column 4)

HEATING SOCIETY ELECTS CARRIER PRESIDENT

Pittsburgh—W. H. Carrier was elected president of the American Society of Heating and Ventilating Engineers at its annual meeting held here recently.

Mr. Carrier is former president of the American Society of Refrigerating Engineers and co-founder and president of the Carrier Engineering Corp.

DETROIT ENGINEERS PLAN MEETING ON CONDENSERS

Detroit—Dr. L. A. Philipp, director of Research of the Kelvinator laboratories, and Hugh Scullen, Kelvinator research engineer, will address the March 16 meeting of the Detroit A. S. R. E. section, presenting a study of design of air-cooled condensers for small refrigerating units.

The meeting will be held in Webster Hall, with the dinner starting at 6:30 o'clock in the evening, and the discussion at 8 o'clock.

Their discussion will be based on tests made on small refrigerator condensers in a wind tunnel last year. Dr. Phillip and Mr. Scullen were both active in these experiments.

Charts will be shown and comparisons made between the theoretical performance of condensers, and their actual capacities under practical conditions.

Alvin H. Baer, national president of the American Society of Refrigerating Enginers is expected to be present, and give a short talk.

REFRIGERATED WATCHES

Elgin, Ill.—Two Frigidaire refrigerators are used in the factory of the Elgin National Watch Co. here to test their watches for operation under low-temperature conditions. Before the cold test, they are subjected to a heat test of 84 deg. F. in specially-constructed ovens.

Temperature vaults in the research department also produce low temperatures for studying watch operation. These rooms are approximately 14 ft. x 7 ft. x 7 ft., and lined with Armstrong cork board. They are cooled by indirect radiation from a brine tank cooled by the 20-ton Carbondale Ice Machine in the power house.

The temperature vaults offer a variation from 38 deg. to 95 deg. F.

FOUR TYPES OF WATER COOLING SYSTEMS IN USE

Circulating, Multiple, Individual, Remote Cooling Systems Are Employed

By John T. Schaefer

WATER cooling has received more and more attention in the electric refrigeration industry, so much that recently the large manufacturers have set up separate sales and engineering departments to cope with the many problems which arise in this growing field.

With the exception of the individual self-contained water coolers, each new water cooling job requires complete and accurate estimating, based on such factors as the maximum number of people drawing water at each outlet, the amount they will consume, and the inlet and desired outlet water temperatures. A complete example of estimating procedures is presented elsewhere in this issue.

There are four general types of water cooling systems, with occasional combinations of two kinds; they are the circulating water system, the multiple system, the self-contained units, and the dead-end lines. The last mentioned type always depends on one of the other systems for its supply of cold water.

There are two fundamental methods of cooling drinking water, direct and indirect, both of which find application in these systems. In the indirect method a bath of water is first cooled, and it in turn cools the pipes through which

(Concluded on Page 9, Column 1)

COLD WATER AIDS FACTORY EFFICIENCY

By W. E. Landmesser,
General Electric Co.

IN this day of modern business methods, it is but natural that modern methods should be employed to properly cool drinking water for employee, employer and patron.

Drinking water is a most important factor in our everyday life. In fact, without water, life would cease to exist in human beings after a relatively short time. There is a reason for this—our bodies are comprised of from 70 to 80 per cent water. The supply must be constantly kept replenished to keep the human machine working efficiently. Furthermore, water is a natural stimulant. It is one of nature's medicines. It is a health builder as well as a preventative for sickness. The healthiest people drink much water as a general rule.

Speed and accuracy are the basic human elements that influence production costs. A lack of either one soon finds costs headed skyward. The ability of a worker to co-ordinate his mind and muscles determines the efficiency of that worker. The condition of the worker's body determines largely the quality of work he does.

It is a recognized fact that employees in offices and factories are more efficient when properly cooled drinking water is made readily accessible to them. In some offices and shops employers recognize the need for cooled drinking water to such an extent that tray service is provided, and employees have water served to them at their work at regular intervals of the day. This keeps the minds of the workers alert, saves much time, and increases general efficiency.

The industrial interests today place a high value on its employees' good will, and consider it an obligation to protect the health and welfare of its employees as far as it is possible to do so, feeling amply repaid for this interest by the loyalty of its workers. The finest of lighting systems assure adequate illu-

(Concluded on Page 3, Column 2)

APEX MANUFACTURING CO. ADDS TO FACTORY FORCE

Cleveland—R. Strittmatter, president of Apex Electrical Manufacturing Co., recently announced that factories have been retooled and that 250 men have been added to the working force.

Sheet Metal Self-Tapping Screws Save Servel $64,120 Annually

(Concluded from Page 1, Column 4)

ing a light but rugged skeleton framework of wood around the cork-covered cores and holding the exterior metal in place by means of wood screws set in through oversize holes punched in the metal and driven firmly into the wooden framing.

In spite of its obvious advantages over any method previously considered, we were never altogether satisfied with the wood frame construction, however. We disliked the method chiefly because the wooden frame was obviously not an essential part of the construction, and the exterior metal was held together only by the pull exerted by the ¾ in. No. 10 wood screws.

The Parker-Kalon self-tapping sheet metal screws appealed strongly to us as the means of solving this problem. By punching mating holes in the exterior metal slightly undersize, we found that ⅜ in. No. 10 P-K screws could be made to cut their own threads and to hold the sheets firmly together. This practice entirely eliminated the wood framing and, in our opinion, produced a better and stronger fastening of the exterior metal.

The use of these screws for this purpose is a comparatively new venture with us, and we are not yet ready to say what gains will be made in assembly labor for the actual mounting of exterior metal. We believe it fairly safe to assume an equality of assembly labor cost, however, for the wood screw and P-K screw methods. The point is actually of minor importance in comparison with other economies which have resulted from the change.

First, of course, the wood frame has been done away with altogether. Considering materials, fabrication and mounting labor, this saves us not less than $1 per cabinet. The cost of 37 No. 10 wood screws formerly added about $0.37, giving a total of $1.037 per cabinet for these two items.

The use of 37 of the new screws per cabinet will involve buying over two and one-half million of them for our contemplated annual output of 70,000 cabinets. These will probably cost us about $3.27 per thousand or $.121 per cabinet.

The difference of $.916 per cabinet ($1.037 minus $.121) represents a cost reduction of more than 88 per cent and will save us about $64,120 a year on an output of 70,000. This saving, coupled with the fact that we are getting a better and stronger fastening than ever before, seems to us justification enough for the change in our assembly methods.

Photo-Electric Cell Control

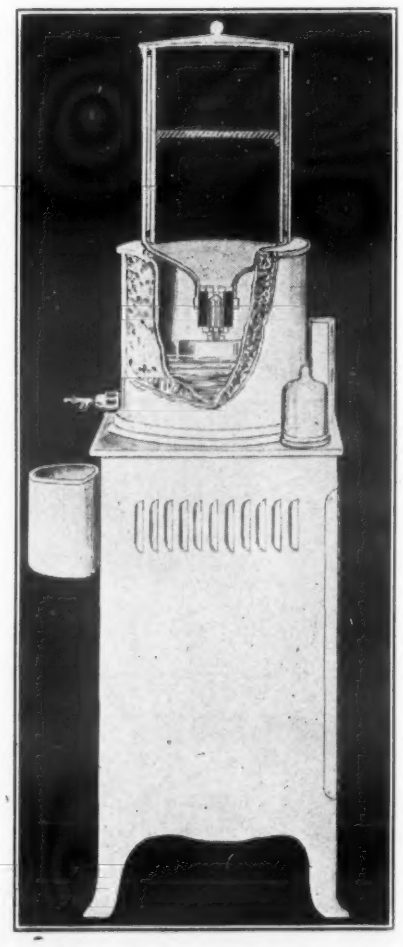
A G-E water cooler at the Detroit Food Show operated automatically by means of a photo-electric cell.

NEW BOTTLE GIVES WATER RADIO-ACTIVE PROPERTIES

(Concluded from Page 1, Column 5)

crushed, refined and molded into a sleeve slightly smaller than the inside diameter of a five-gallon bottle.

The bottom of the bottle has been removed, and a specially designed valve placed in the neck to regulate the flow into the cooling equipment. The user pours ordinary city water into the inverted bottle at night, and in the morning can draw filtered water which officials of the company claim is equal in radio-activity to that of the world's most famous health springs.



Radio-Active Water Bottle

The International Critical Tables which were prepared by the National Research Council, Washington, D. C., in conjunction with several governments, indicate that water from these jars has a radio-active strength of 100. Hot Springs, Ark., showed a test of 61.

Filtration is accomplished by a Tripoli stone filter, mined in Central Arkansas, and fabricated in a round stone 1¼ inches thick, which is fixed about the center of the bottle. Other than simply cleaning the filter and sleeve once a month, no maintenance is necessary, he said.

Analyses of water treated with this radio-active substance have been made by the universities of Colorado, Minnesota, Washington, Oregon, Arizona, British Columbia, and the Bureau of Science of the Philippines, all of which certify the presence of radio-active strength in the water.

Mr. Parrish identifies radio-active values with life principle and vitality in water. "All water in contact with its natural source contains radio-activity, life principle and vitality. As long as it is in contact with its source, water is a living thing like plant life," he said.

"But water in city mains has been removed from its source so long that it has lost its radio-active health values," he said. Carnotite ore, he maintains, will replace these values in city water.

The carnotite liner is insoluble in water, only the positive electrical ions emanating from the ore being absorbed by the water.

UNIVERSAL COOLER USES LARGE TANKS

By Chas. L. Curtis
Universal Cooler Corp.

BELIEVING that the most practical method of cooling water is to use a large storage tank which will take care of the largest load which will be needed for a day, Universal Cooler engineers recently installed a circulating water system in the Remington Typewriter building, Chicago, in connection with a 160-gallon galvanized tank. This plan removes the necessity for a very large refrigerating unit which would be needed without a large storage tank.

A one hp. compressor was placed in the basement, feeding a direct expansion copper coil in the tank. The equipment is controlled with an automatic expansion valve and thermostat.

Cooled water is circulated around to the 12 bubblers in this eight-story building by a small circulating pump installed beside the water cooling tank.

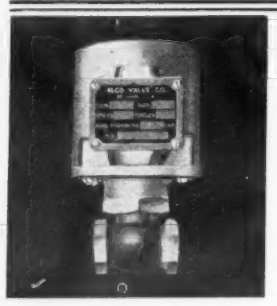
The pump is turned on at 7:30 a. m. and shut off at 5 p. m., allowing the refrigerating unit to cool approximately 160 gallons of water throughout the night, and providing a completely filled tank of cold water to start circulating the first thing in the morning. The refrigerating unit replaces, during the day, all water consumed at the bubblers.

The storage tank was insulated with six inches of ground cork, two inches of Balsam Wool, and a brick shell around the entire tank. A water filter installed in the city lines assured pure water throughout the drinking water system.

ICEBERG MODELS OFFER THREE COOLING FEATURES

Gardner, Mass.—Certain models of water coolers made by the Iceberg Manufacturing Co. of this city combine features of water cooling, ice cube manufacture, and provide a storage compartment.

All water coolers are of all-steel construction, with sides furnished in Duco, and tops of porcelain. They are supplied in either chrome plated copper or earthenware crocks. All units are thermostatically controlled, and utilize the dry system of refrigeration.



ALCO CONTROL VALVES installed on your refrigerating system will save you money

Because they:

1 Reduce Electric Power Bills. By use of automatic control, the machine only operates when you actually need refrigeration.

2 Reduce Water Bills. The Alco Magnet Valves provide an instantaneous shut-off of the cooling water.

Even though your machine is equipped with an automatic water valve, the use of this magnet valve is desirable in that it provides a positive shut-off at the instant the machine stops.

3 Maintain More Constant Temperature. Feeding the amount of refrigerant for the load you have today—not the load you had yesterday!

4 Require Less Attention. Instead of manually regulating your expansion for every load change, let an Alco Valve do it automatically.

Ask a competent engineer about automatic control, or write us for descriptive literature

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West Coast Representatives: Pacific Scientific Company, Los Angeles—San Francisco

Eastern Office: 433 East Montana Ave., Philadelphia, Pa.

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for
Refrigerators — Water Coolers
New model now available for use on city water pressure

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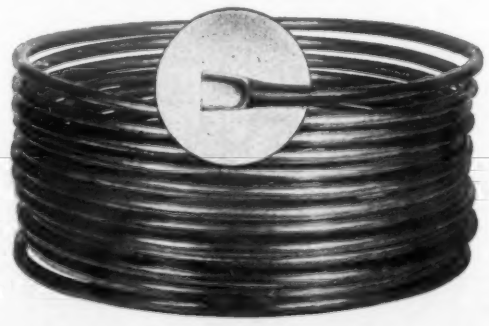
147 Hudson Street New York City

The Ideal Water Cooler Tubing

"Wolverine Electro-Tin-Plated"
(Coated with Pure Tin)

DEHYDRATED and SEALED

Delivered in straight lengths up to 20 feet—or coils of greater length—or fabricated exactly to your specifications—dehydrated and sealed as required—electro-plated with pure tin. It is free from scale, moisture and defect—made to A.S.T.M. Specification B-68-30T.



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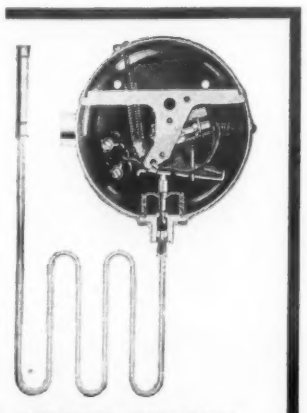

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MODEL LL-1

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Here is absolutely dependable temperature control for your commercial jobs at a low price. For frozen food cases, milk coolers, soda fountains, ice cream cabinets and many other kinds of equipment, this Mercoid gives perfect automatic control. Easily adjusted for any cut-in or cut-out point.

There is a Mercoid for every refrigeration need—to control by pressure or by temperature. And there are Mercoids that combine automatic control with high pressure cut-out in one instrument.

Mercoid controls, for regulating temperature, pressure or vacuum operate with the well-known Mercoid switch—no exposed arc—no corrosion of contacts—and the control carries full line current, either 110 or 220 volts.

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ENGINEER EXPLAINS FILTER OPERATION

(Continued from Page 1, Column 1)

tion of many of the present day coolers are such that chilling compartments act as small settling tanks, allowing the suspended matter in the water to precipitate, and eventually form an insulation wall between the water to be cooled and the expansion coil compartment.

As this accumulation or deposit increases, the efficiency or cooling capacity of the cooler decreases. By filtering the water immediately before it enters the cooling compartment, all suspended matter is removed and the accumulation is reduced to a minimum.

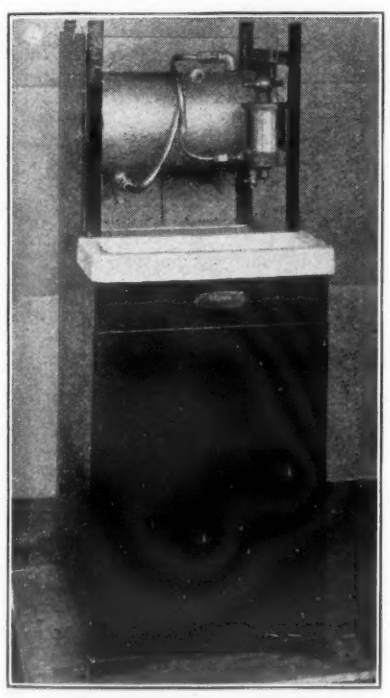
The prime duty of any filter, of whatever make, is to extract and hold all the suspended matter, however minute. Therefore, it will be seen that the efficient filter will accumulate on its filtering element a varying amount of suspended matter, consisting of iron, vegetable matter, and the ingredients of common dirt.

The filter to be efficient and practical must of necessity retain all this suspended matter and still permit practical volumes of water to pass through. As the accumulation increases the flow naturally decreases and eventually the filter must be cleaned. There is no such thing as a perpetual filter that does not require cleaning. A filter that is not cleaned becomes a breeding place for undesirable bacteria.

The most suitable filter for installation with pressure type electric water coolers is that filter which not only retains all the suspended matter and still renders an adequate volume of water, but that also provides a quick, easy and complete means of cleaning or renewing the filtering element.

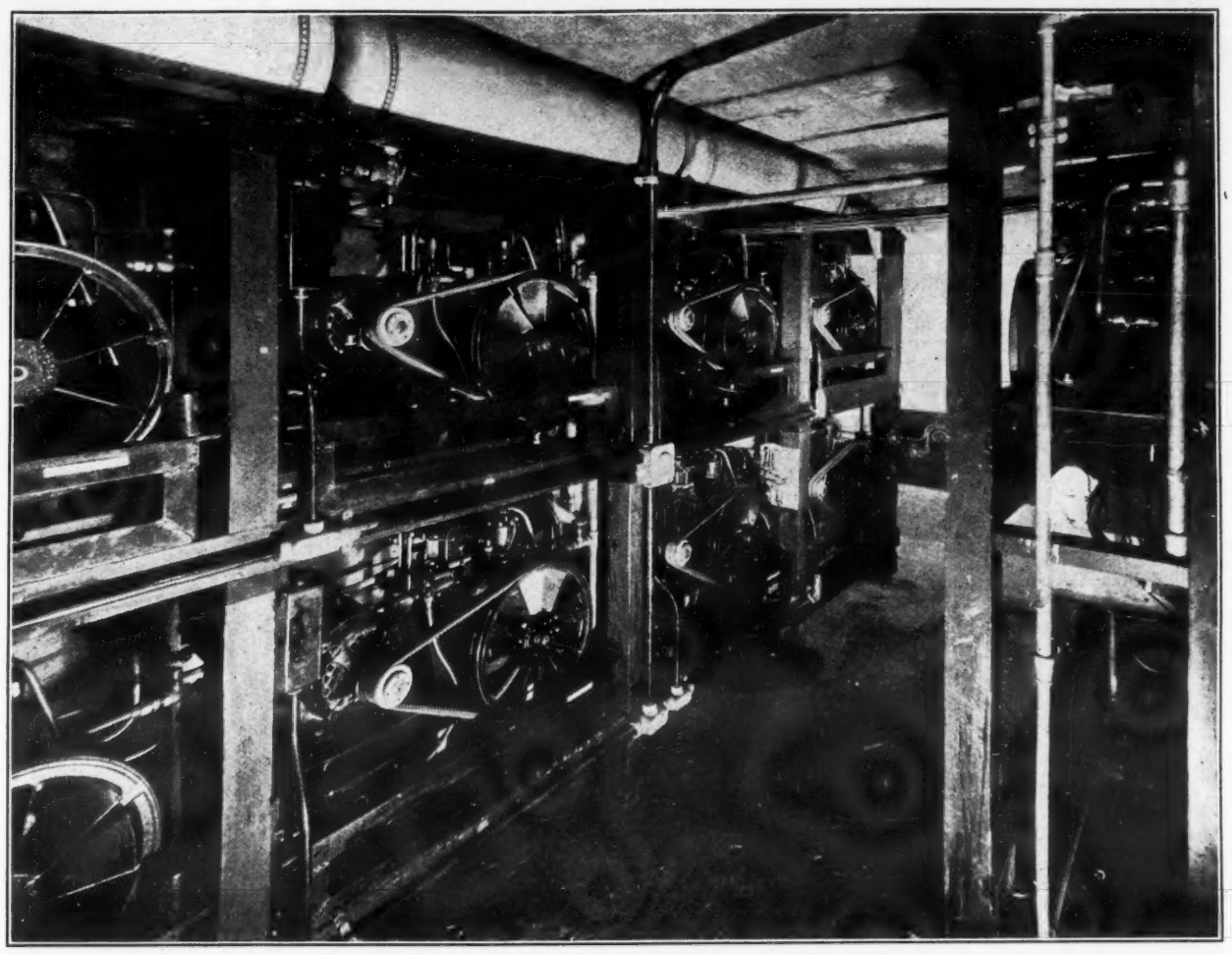
The most practical, sure, easy and inexpensive way of completely renewing the original efficiency of a filter is to remove the filtering element with all the suspended matter and dirt that it has collected, and replace with new, thus definitely and absolutely restoring it to its original efficiency.

Filters play a most important part with those companies who make it their business to rent as well as sell electric water coolers. Many distributors have increased their sale of electric water coolers materially by promoting their sales to new or established companies who rent or sell electric coolers.



Filter Equipped Cooler

Compressor Installation at Euclid Beach Park



This battery of compressors is installed in Cleveland's Euclid Beach Amusement Park to cool the beverages served from 26 draft arms. Liquid Cooler units are used in the fountains, which serve drinks at 40 deg. F.

PROPERLY COOLED WATER AIDS WORKERS' EFFICIENCY

(Concluded from Page 1, Column 5)

mination in the modern factory; the most efficient ventilating facilities are in use, and, for exactly the same reasons, electric water coolers play an important part in modern industry.

Serving the needs of employees for properly cooled drinking water, as well as a courtesy service for patrons, visitors and guests, electric water coolers strike the keynote of a modern service. With the easily adjustable temperature control, the temperature of the water can be regulated to meet the requirements of different working conditions; the lower temperature for the office employee and the higher temperature for the worker in the foundry, with the assurance that the water will be palatable in each case. If water is too warm, it is unsatisfactory: yet, if it is too cold, it can cause severe cramps; therefore, the modern electric cooler assures water at the right temperature under whatever conditions the need may be.

Safety committees, public health departments, welfare workers, industrial specialists, efficiency experts and others attest to the merits of electric water coolers, because they make possible the furnishing of properly cooled water for employees under all conditions, and from this will come a greater appreciation of the need for electric cooling equipment.

The opportunities in the water cooler field are unlimited. Types of applications may be varied, but wherever people meet or congregate there is a need for water coolers, and with thousands of salesmen telling the advantages of properly cooled water and the economy and efficiency effected with same, 1931 will bring closer to us the day of real business in the sale of electric water coolers.

DETROIT FAMILIES BUY SPRING WATER

Wyandotte, Mich.—Many of the electrically refrigerated bottle coolers in Detroit and nearby towns use spring water bottled by W. H. Flumerfelt, of this city, who gets it from the artesian wells at Rochester, Mich., 40 miles distant, and delivers it to his customers in five-gallon bottles.

The whole town of Rochester is enthusiastic about their "Pure Spring Water," using it for all purposes, and having plenty to spare. There is no pumping problem, as the water gushes up four feet above the ground whenever a new well is sunk; rather, the problem is to direct and utilize the water each time a new 12-in. pipe is driven for more water.

Mr. Flumerfelt has his railroad tank cars pulled into Rochester, where they are filled by hose from the supply. Then the cars are hauled the 40 miles to his bottling plant in Wyandotte, where his two specially-built Ford trucks deliver the five-gallon bottles to customers in Detroit, Monroe, Wayne, Trenton, Grosse Isle and Grosse Point.

A dollar deposit is asked of each customer for the bottle, while the water itself sells at 80 cents per bottle to domestic users and 70 cents to large-quantity users in office buildings, banks, and institutions.

Each bottle is sterilized by steam before being sent out again, as are the tank cars that convey the water from Rochester to Wyandotte. Monthly inspections are made by the Detroit Board of Health, and occasionally by the Detroit Testing Laboratory and the State Board of Health, who have certified the sanitation of methods used in Mr. Flumerfelt's organization.

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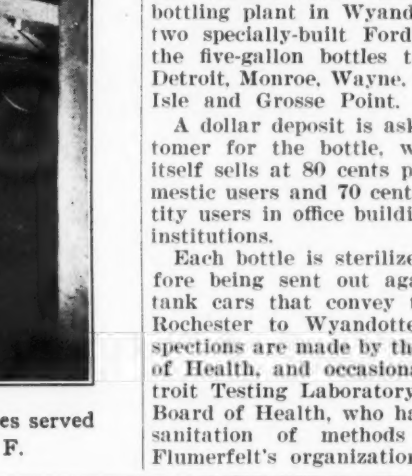
TIME-O-STAT

No. 178

WATER VALVE



Interior view of Time-O-Stat No. 178 Water Valve, showing construction. Note the lever arrangement (six to one ratio) which insures positive valve opening and closing. Also the inverted valve seat which is self cleaning.

HERE is a simple, rugged, electric water valve for automatic refrigeration application. The No. 178 may be placed under the direct control of a thermostat or pressure control or may be wired in parallel with the compressor motor to control the flow of cooling water to the compressor.

The Time-O-Stat No. 178 *Water Valve* is constructed of heavy cast brass and is arranged for connection to a 3/8" standard pipe. A removable cap is provided for flushing and cleaning the Valve. This valve will work on pressures up to 150 pounds and has sufficient capacity for most applications.

Write for full information.

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DEMONSTRATION OF PRINCIPLES OF ESTIMATING

Water Cooling Systems Explained, Calculations Traced by Engineer

By L. M. Jordan, Research Engineer, Donalsonville, Ga.

THE problem of supplying proper drinking water to large groups of persons such as hotel guests, office building occupants and visitors, college and university students, apartment house tenants and industrial plant operatives is a complex one by any method employed, and is a vital one for a number of reasons.

By proper drinking water is meant pure water, free from disease-creating bacteria, properly clarified and deodorized, and supplied at a palatable, refreshing temperature at points that minimize drudgery and time wastage in taking drinks. The only dependable method of maintaining uniform temperatures in drinking water is by the direct application of mechanical refrigeration.

Names Four Systems

For this purpose there are four general systems, namely, the individual system, the circulating system, the multiple system, and the dead end system, the latter being dependent upon one of the other three for its supply of cooled water. Either of these systems is adaptable to any type of a building, structure or place where cooled drinking water is required in quantities, even to sea-going ships, public parks or play grounds.

All of these except the individual have certain limitations in areas of distribution, but the use of one of the other three is advisable in some cases. Neither of them requires any unusual engineering skill, either for its installation or operation, but all of them require certain calculations as to requirements of capacity based upon quantities of water required per unit of time, temperature differentials, etc.

Circulating System Discussed

Due to line losses in the circulating system, extreme care must be exercised in checking and calculating local conditions, and this system will be discussed.

The essential parts of one of these circulating systems are the compressor, the condenser, a cooling tank or chamber for the water, a circulating pump, the necessary piping for forming the distributing circuits, the insulation for the piping, and the drinking fountains or "bubblers."

The compressors used with these systems are identical in type with those used in cold storage practice, etc., are exceedingly simple and compact, semi-portable, occupy little space, and are readily installed.

The cooling tank need not be elaborate but should be of considerable tensile strength, and should be made of a metal that will not readily corrode or set up other harmful chemical reaction.

The circulating pump may be either the centrifugal, multi-cylinder plunger or turbine types, but must be of a type that will maintain a steady, non-pulsating flow through the circuits to prevent the water issuing in gushes from the fountains. Galvanized wrought iron may be used for the circuit piping.

There are two arrangements of circulating systems, one of which, because of the fact that the water in the cooling tank is directly open to atmospheric pressure, may be appropriately called the "Open System," while the other, not being exposed to atmospheric pressure, may be called the "Closed System." These two systems are shown in diagrammatic detail in Figs. 1 and 2 of the drawings. These are the arrangements usually employed in tall buildings of several stories, but the principle can be gleaned from a study of the drawings and applied to any type of building.

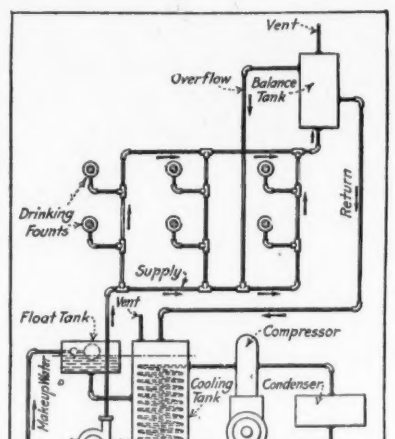


Figure 1. Open System

In the case of tall buildings the compressor, condenser, cooling tank and circulating pump are usually installed in the basement, with the distributing circuits rising through the rooms overhead, as suggested in the drawings.

In case the head pressure from the water source is not sufficient to elevate the water above the highest point of the circuits, the open system must be employed. In this case the water supply is maintained in the cooling tank by means of a small auxiliary float tank located at the approximate level of the top of the cooling tank, and as the level falls in the cooling tank, the float in the float tank drops also, automatically admitting more make-up water to the tank.

In case the head pressure from the source is sufficient to raise the water above the highest fixture, either the open system or the closed system may be employed, but the preference is always in favor of the closed system, due to reduced operating cost.

This is due to the fact that in the case of the open system, the circulating pump is required to lift the water through the circuit risers, thereby requiring more power, while in the closed system the only work required of the pump is to overcome the friction of the pipes. In this case the water supply is maintained by a similar float tank located above the circuit, as shown in Fig. 2, and operates in the same manner.

Pump to Do No Lifting

No lifting is required of the pump because of the counter-balance of the water in the supply and return sides of the circuits. In this case the cooling tank is required to withstand the static head of the water in the risers in addition to that of the water in the tank proper. Thus, it requires the cooling tank to be of greater strength than that used with the open system where only the pressure of the water in the tank must be carried, regardless of the height of the circuits.

The pressure necessary for a liberal jet from the fountains in the case of the closed system is supplied from the static head of the water in the risers, and due to this fact, the float tank should be located at least 15 ft. higher than the high point of the risers, in order to develop the necessary pressure for the highest fountains.

The cooling tank in either system contains the expansion coil of the refrigerating machine. The water is cooled to the desired temperature in the cooling tank and the circulating pump takes it from the tank and keeps it under constant circulation throughout the circuits.

This constant circulation is absolutely essential to maintain the desired temperature of the water throughout the circuits. In installing the distributing piping, care should be taken to avoid all sharp or abrupt bends, as this is a source of considerable increase in friction head, which if not kept at a minimum, will considerably increase the cost of pumping.

Where the building or structure covers considerable area it is always the best practice to locate the cooling outfit centrally, employing a number of short circuits to reach the remote parts.

The distributing piping may be laid either above or underground. Where it passes through sheltered space, as through the departments of an industrial plant, no protection is necessary other than the insulation. But where it extends through open space, the insulation should be protected with at least one layer of 2-ply roofing applied in such a manner as to shed rain water. Care should also be taken that no distributing piping is exposed to the sunlight, as this will cause a considerable increase in refrigerating load.

Factors to be Considered

In calculating the size and capacity of the equipment which will be required to handle any problem of water supply by this method, there are a number of factors to be considered, chief among which are: the average number of persons to be served and the character of their occupation; the average temperature differential between the atmosphere and that at which it is desired to serve the water; the average temperature differential between make-up and drinking waters; the length and size of the circuits; and the efficiency of the insulation. It is obvious that the workers in a metal-working plant will consume more water than the employee doing light manufacturing, and that clerical forces, hotel guests or college students will consume less still than persons doing manufacturing work. Industrial workers will consume (use and waste) up to .30 gallons of water per person per hour. Each plant presents a different set of operating conditions requiring separate calculations, but a specimen calculation can be given.

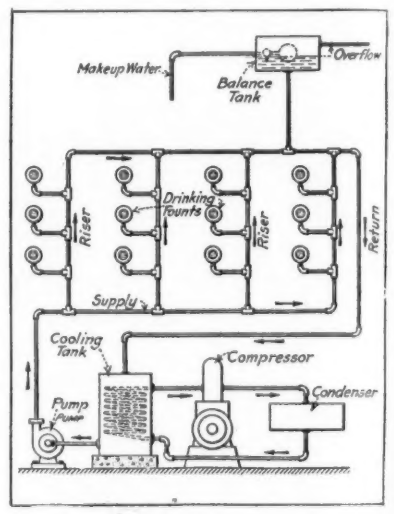


Figure 2. Closed System

Suppose, to illustrate the calculation of machine needs, we assume an industrial plant consisting of two single-story buildings, with the cooling plant centrally located, and served by two separate loops. One of the loops, 2,000 ft. long, we will call No. 1 circuit. It serves 300 men in one of the buildings.

The other loop is 600 ft. long, and serves 100 men in the other building. The two circuits are connected with the cooling tank by a feeder circuit 100 ft. long. One-inch piping will serve the purpose of the two delivering circuits, while 1¼-in. piping is used for the feeder circuit. The proper degree of temperature for drinking water is recommended by health authorities to be between 45 and 50 deg. F., within which range we will control the temperature.

Assumes 95 Degree F. Atmosphere

The average temperature of the atmosphere is 95 deg., making the average difference between it and the line water temperature 47.5 deg. F. The employees consume an average of .25 gallons each per hour, and the temperature of the make-up water is 75 degrees F. What will the rating of the compressor be that will be required to handle the installation?

With each employee consuming an average of .25 gallons of water per hour, the total consumption (used and wasted) from No. 1 circuit will be

.25 x 300 = 75 gals. per hour.

In addition to this, there must be circulated a sufficient quantity to offset the heat absorbed along the line.

A 1-in. pipe line, properly insulated, will absorb heat at the rate of .152 British thermal units per lineal ft. per degree difference in temperature per hour. The average difference is 47.5 degrees, therefore, this circuit will absorb a total of

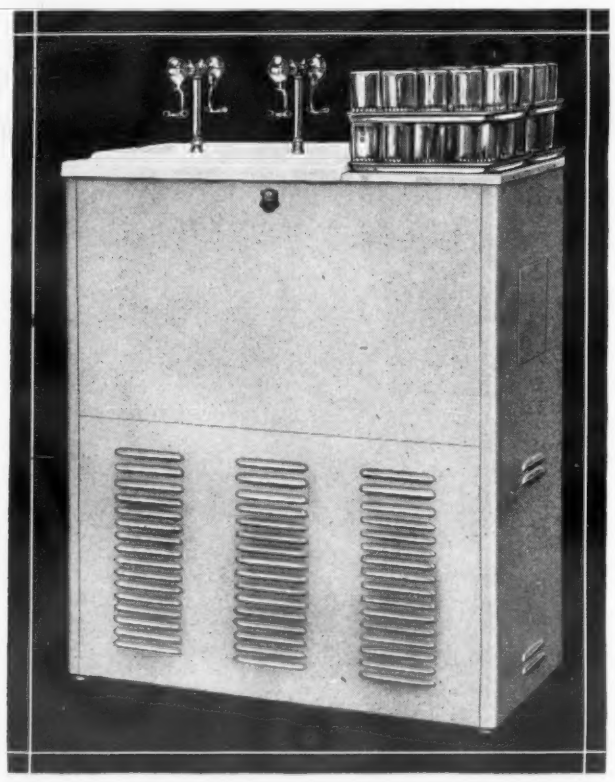
2000 x 47.5 x .152 = 14,400 B.t.u. per hr.

One B. t. u. is required to raise one pound of water one degree in temperature, and a 5-degree rise is allowed for

(*Concluded on Opposite Page*)

» » DAY AND NIGHT STORAGE WATER COOLERS

DAY AND NIGHT



RESTAURANT AND CAFETERIA COOLERS

Illustration on left is Model RC-20-4 Cabinet Cooler for enclosing condensing unit in base. Storage—20 gallons or 320 glasses for sudden peak loads. There are six models of cabinet coolers. Shelves for storage of glasses easily attached to all models.

•

Below is Model RL-10-2 Remote Type. Storage—10 gallons or 160 glasses for sudden peak loads. Shelves for storage of glasses supplied at small extra cost. There are four models of remote coolers.

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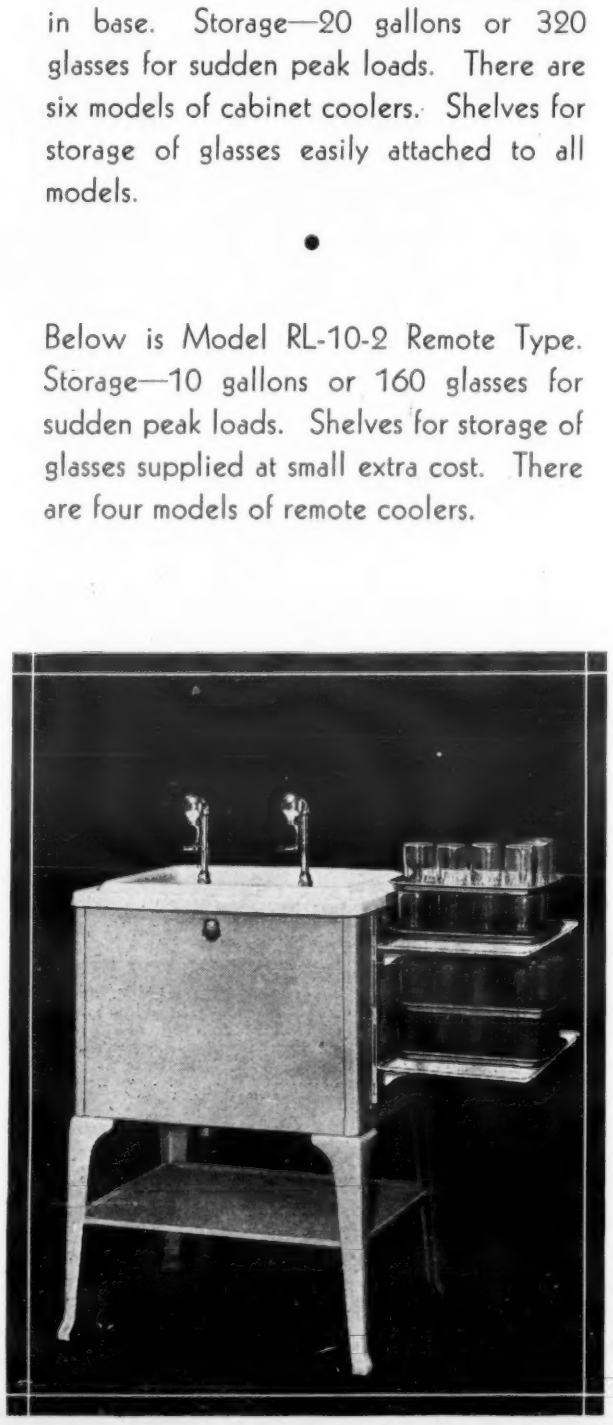

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DETROIT FORGING COMPANY
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WATER COOLING REQUIREMENTS, INSULATION

FIGURES VELOCITY, COMPRESSOR SIZE

(*Concluded from Opposite Page*)

in our case. This is customary in practice. Therefore

14,400 ÷ 5 = 2,880 lbs. of water per hr.

Since there are 8.3 pounds of water in one gallon, in 2,880 pounds there are

2,880 ÷ 8.3 = 347 gals. to be recirculated.

The grand total that must be pumped through this loop is the sum of the 75 gallons used and wasted, plus the 347 gallons recirculation, or 422 gallons per hour.

The velocity in this line is

422 ÷ 60 (minutes) ÷ 4.78 (gal. per cu. ft.) = .94 cu. ft. per minute

The inside cross-sectional area of a 1-in. pipe is .006 sq. ft. Therefore

.94 ÷ .006 = 157 lineal feet of travel per minute.

The calculation procedure for No. 2 circuit is identical with that for No. 1 circuit. The water consumed is

100 (men) x .25 (gal. per man) = .25 gals. per hour.

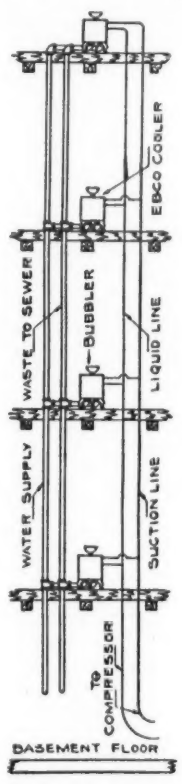
The heat absorbed by this loop is

600 x 47.5 x .152 = 4,330 B. t. u. per hr.

To control the temperature within the stated range, an additional amount of water to be circulated of

4,330 ÷ 5 = 866 lbs.

or 8,660 ÷ 8.3 = 104 gals. per hour.



Multiple System

The total amount to be circulated for consumption and temperature control in this circuit is the sum of the 25 gals. used and wasted plus the 104 gals. required for recirculation, or 129 gals. per hour.

The velocity in this line is

129 (gallons) ÷ 60 (minutes) ÷ 7.47 = .29 cu. ft. per minute or

.29 ÷ .006 = 48 lineal ft. of travel per minute.

The amount of water the 1¼-in. feeder circuit will be required to supply is the sum of the .94 cu. ft. per minute for No. 1 circuit, plus the .29 cu. ft. per minute for No. 2 circuit, or 1.23 cu. ft. per minute. The total length of this feeder circuit is 200 ft. (supply and return sides). The inside cross-sectional area of a 1¼-in. pipe is .0104 sq. ft. The velocity will therefore be

1.23 ÷ .0104 = 118 lineal ft. of travel per minute.

The temperature in the supply side of this main circuit is 45 deg. F., and in the return side, 50 deg. The difference in the temperature of the atmosphere and the water in the return side is (95—45) 50 deg. A 1¼-in. pipe line, properly insulated, will absorb .173 B. t. u. per lineal foot per degree difference in temperature per hour. Therefore the total absorption of this line is 100 x .173 x 50 = 778 B. t. u. per hour.

The quantity of water required for this main circuit is the sum of that drawn from the fountains plus that required for temperature control in the delivering circuits or

For No. 1 circuit 422 gal. x 8.3 = 3,500
For No. 2 circuit 129 gal. x 8.3 = 1,070

or a total of 4,570 lbs. per hour.

The total heat absorbed in both sides of this main is 865 B. t. u. per hour. The total rise in the supply side is

865 ÷ 4,570 = .19 deg. F.

The temperature of the water upon entering the delivering circuits is to be 45 degrees. Then the theoretical temperature of the water in the cooling tank is

45 — .19 = 44.81 deg. F.

The quantity of water returned by the return side is the sum of the quantities circulated through both delivering circuits to control the temperature, or 451 gallons, or 3,746 pounds per hour.

The temperature rise will be

778 ÷ 3,746 = .21 deg.

The temperature of the return water upon entering the cooling tank is the sum of the difference in temperature or 50 deg. plus the heat picked up along this line, or a total of 50.21 deg. The temperature of the make-up water is reduced from 75 deg. to 44.81 deg., initially, and the water returned by the main circuit is reduced from 50.21 deg. to 44.81 deg.

The total amount of water consumed from both circuits is 100 gals. per hour. Therefore

100 x 8.3 = 831 pounds that must be cooled through (75—44.81) 30.19 deg.

The cooling load on the refrigerating machine arises from two sources, that of cooling the make-up water to the desired temperature and the removal of the heat picked up by the circuits. The load arising from initial cooling is

830 (pounds) x 30.19 = 25,000 B. t. u. per hour, and that from the return water is

452 x 8.3 = 3,750 lbs. to be cooled through (50.21 — 44.81) 5.4 deg. or

3,750 x 5.4 = 20,200 B. t. u. per hour.

The final total cooling load is therefore the sum of the 25,000 B. t. u. from initial cooling, plus the 20,200 B. t. u. from return water, or 45,200 B. t. u. per hour. One ton of refrigeration is the equivalent of 12,000 B. t. u. per hour or 288,000 B. t. u. per 24 hours. Therefore the rating of the compressor required to handle our installation will be

45,200 x 24 ÷ 288,000 = 3.76 tons.

The life of any compressor will be considerably prolonged if it is given occasional rest periods, and for this reason, to provide for possible extensions and to cover slight additional losses, a 5-ton machine should be installed.

Armstrong Cork Man Describes Use of Water Cooling Insulants

(*Continued from Page 1, Column 3*)

palatability of the water at all fountains is reflected by this saving and adds to the favorable impression made by the cooling water system generally.

There are available for insulating cold lines and tanks a number of materials. Those used most often are cork and felts of various types. Cork is the most widely known and generally used material, as it is the accepted standard for the insulation of lines, tanks and other structures against the flow of heat encountered under refrigeration conditions.

Ordinarily, there is employed for service at drinking water temperatures, a thickness of cork covering ranging from 1½ to 2 in. Its use on this class of service has led to its being known as ice water covering. Ice water thickness cork covering is furnished in sectional form to fit standard wrought-iron and steel pipe and the fittings employed in pipe-line construction.

Cork covering is fitted to the lines, cemented on lateral and end joints in waterproof cement, and wired in place with copper-clad steel wire ties; after which the whole surface of the covering is painted with asphaltic paint or finished as desired.

It is sometimes the tendency to use makeshift fitting covers at the fittings—that is to say, the straight pipe covering is either cut and fitted around the fittings, or a plastic or felted material is used for the irregular fitting surfaces. This results in unsightly work and inefficient insulation, and frequently the coat is higher for the makeshift job than if the proper fitting covers were employed.

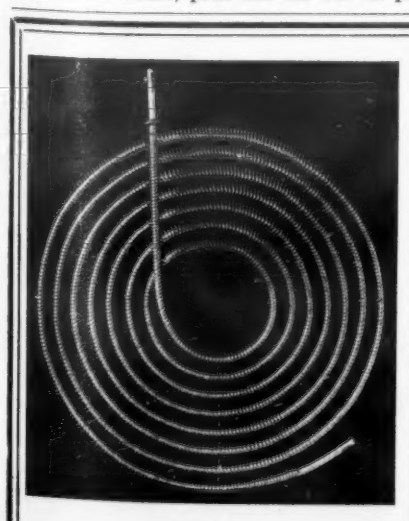
For storage tanks, coolers, pump chambers, and other irregular surfaces, cork in lagging form may be applied, so that essentially the same thickness of insulation may be provided on tanks as on circulating lines.

On refrigerating lines a greater thickness than ice water thickness is required and, depending on the temperatures held, from 2½ to a 4 in. thickness of cork is ordinarily placed on refrigerating suction and low temperature brine lines.

Brine thickness cork covering is provided for this service on low temperature lines, and it is frequently true that the thicker covering may be used on the circulating water lines, since the saving in refrigeration justifies the use of the thicker covering, particularly on the non-circulating system.

The table of heat transmission on the next page gives the transmission in B.t.u. per lineal foot, per degree Fahrenheit temperature difference, per hour, of pipe lines ranging from 1 in. to 6 in. in size. This table may be used to approximate the refrigeration loss from any line, and it may be similarly employed to get an idea of the temperature rise which may be expected in the water over a given length of time based on any velocity of

(*Concluded on Page 6, Column 5*)



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REFRIGERATOR *Insulation*

For the first time, carefully selected national magazines will carry a series of striking advertisements featuring the insulation of refrigerator cabinets.

Celotex has already developed a tremendous nation-wide preference in the minds of home owners as effective insulation. Now this prestige will be pointed directly into the field of refrigeration—giving dealers who handle Celotex-insulated cabinets a powerful advantage in retail selling.

•

The word Celotex (Reg. U. S. Pat. Off.) is the trademark of and indicates manufacture by The Celotex Company.

The Celotex Company, 919 North Michigan Avenue, Chicago, Illinois. In Canada: Alexander Murray & Co., Ltd., Montreal. Sales distributors throughout the World.

When you talk "ECONOMY"
you must talk "INSULATION"

THE insulation of your cabinets is altogether too important to pass over lightly in retail selling. For effective insulation is the most important factor in assuring economical refrigeration.

Celotex Refrigerator Insulation is fabricated of special processes that increase its efficiency to the highest practical point.

But insulation must have many other qualities of outstanding importance. And Celotex meets every one of these requirements to perfection.

That's why more than 25 leading manufacturers have adopted Celotex as the latest improvement in cabinet construction.

• • • •

NO HEAT-LEAKING CRACKS OR JOINTS. Each insulated area is covered with a single board of Celotex, cut to just the right length, width and thickness. There is no "patchwork" of pieces, full of leaky joints and cracks.

STRONGER, MORE SUBSTANTIAL CABINETS. Celotex reinforces the framework of cabinets, adds lasting structural strength to walls and doors, gives your customers the desired durability. Yet it is so light that it adds little to the weight of the cabinet.

CLEAN, ODORLESS, SANITARY. Celotex is made from long, tough fibres of cane that produce its remarkable insulating efficiency. These fibres are carefully sterilized. They are entirely odorless. They are waterproofed to resist absorption of moisture. No insulation could be more sanitary.

Make sure your salesmen understand all the reasons why Celotex-insulated cabinets promise greater satisfaction to your customers. Have them use these reasons in every retail sales talk.

CELOTEX
BRAND
INSULATING CANE BOARD

HOT, COLD WATER TANKS EXPLAINED

By F. E. Wood, Chief Engineer, Day and Night Water Heater Co.

THE opposite ends of the thermometer scale which are ordinarily thought of as being in a constant state of war with each other, have at last found a common ground in the use of the storage principle for the supply of both hot and cold water.

The storage idea in water heating involving the use of an insulated storage tank in which a quantity of water heated by suitable means is kept hot ready for instant use, has practically monopolized the water heating field.

It has gained favor among users of hot water on account of the simplicity of the equipment, convenience and adaptability to varying service conditions. Public utilities have approved storage hot water systems because their distribution systems are not taxed by peaks of demand, as is often the case with large capacity instantaneous systems.

Water cooling is a problem as distinct from the general refrigeration problem as the water heating problem is distinct and different from those of heating and cooking. The difference lies in the great heat absorbing capacity of water.

In water heating, it has been demonstrated that the best way of securing satisfactory service is to apply a small amount of heat over a comparatively long period of time, storing up a quantity of hot water against peak demands.

In water cooling it is evident that the same principle will apply, since for a given installation with the help of insulated storage capacity of suitable size, a small refrigerating unit will meet the service requirements in most cases much more satisfactorily than a very much larger condensing unit without storage.

Analogy between the two types of equipment is very interesting. A typical water heater of simple design has the burner located in the base of the combustion chamber of the heater, from which the hot products of combustion are conducted upward over the heating surfaces provided within the water in the storage tank.

An enlargement of the vent or flue with suitable baffles provides the means by which the heat is transmitted into the water. The insulation surrounding the tank keeps the water hot until needed. When hot water is drawn a thermostatic device operates to light the burner and heat the incoming cold water to a predetermined temperature.

The insulated water cooler illustrated here shows the inner chamber, or finned boiler, in which is maintained a supply of the refrigerant at a level regulated by the float valve controlling the supply of liquid refrigerant. The refrigerating unit is generally located at some remote point. The surfaces of the boiler are entirely surrounded by the water to be cooled and correspond to the heating surfaces in the water heater.

This type of cooler is finding increasing use in office buildings, industrial establishments and restaurants. For office buildings and industrial establishments it is particularly useful on account of the fact that multiple operation permits of small storage units being placed at various points throughout the buildings wherever cold water service is required.

The refrigerant is supplied to these storage units from a central refrigerating plant. This type of installation not only serves to put the cold water at the point where it is to be used, but it eliminates long runs of cork-insulated water lines.

There is an added advantage from the fact that the first cost is frequently less than with self-contained units. In restaurants its special value lies in the fact that large storage capacity permits of easily taking care of peak loads without at any time overtaxing the refrigerating equipment.

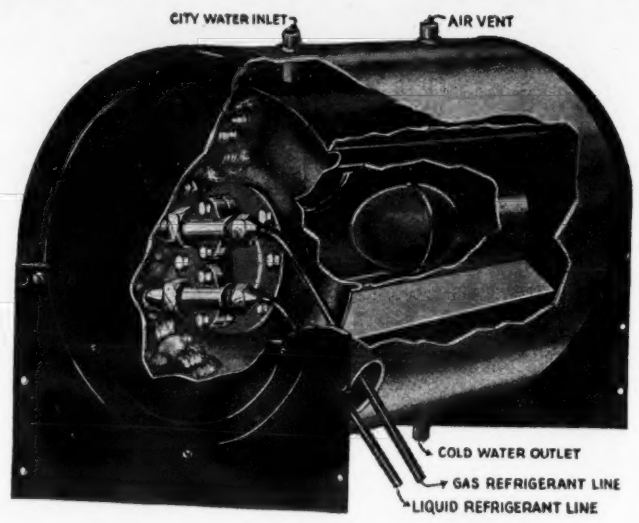
Another interesting application of this principle is in connection with soda fountain work. The storage type cooler is especially adaptable for pre-cooling of water for the soda fountain.

From the standpoint of the refrigeration dealer and user, the advantages of the storage cooling system may be summarized somewhat as follows:

1. The comparatively small refrigerating capacity required as compared with any other method of supplying equivalent cold water service.
2. The ease with which peak demands for large quantities of cold water may be met.
3. Its adaptability to varying conditions and the extent to which it simplifies soda fountain equipment when used for pre-cooling, and also in connection with beverage, water, and space cooling.
4. Its adaptability for multiple operation of several cooling units from a central refrigerating plant.
5. The ease with which these installations may be modified to secure any desirable rate of recuperation.

When backed by careful workmanship and sound engineering, this type of water cooling equipment gives promise of living up to the reputation of its older sister, the storage type water heater, and making a large place for itself in the water cooling field.

Day and Night Cooling Unit



Float valve controls supply of refrigerant.

COLUMBIA ELECTRIC CO. ANNOUNCES NEW POLICY

Cleveland—Brushes on the new electroplating generators manufactured by the Columbia Electric Mfg. Co. of this city are guaranteed for three years, according to a recent announcement.

The brushes are adjusted before the generator leaves the factory, and locked in that position.

LLOYD DISCUSSES COOLING INSULANT

(Concluded from Page 5, Column 5)

flow which may be set. In using the table, it must be remembered that by definition 1 B.t.u. must be absorbed in cooling 1 lb. of water 1 deg. F.

Manufacturers of refrigerating equipment used in drinking water service normally specify the amount of water which can be cooled by their equipment over a given temperature range. In designing a circulating system it is, of course, necessary to allow for the heat loss through the covering and it is this heat loss which can be approximated by the figures in the table below.

The location of fountains, and the number and type used, are of course dependent on the type of building or industry to be served. The steel industry may be accepted as representing the maximum demand both in number of fountains and amount of water used and wasted. A well-known steel plant has set the number of fountains at one for each 30 men.

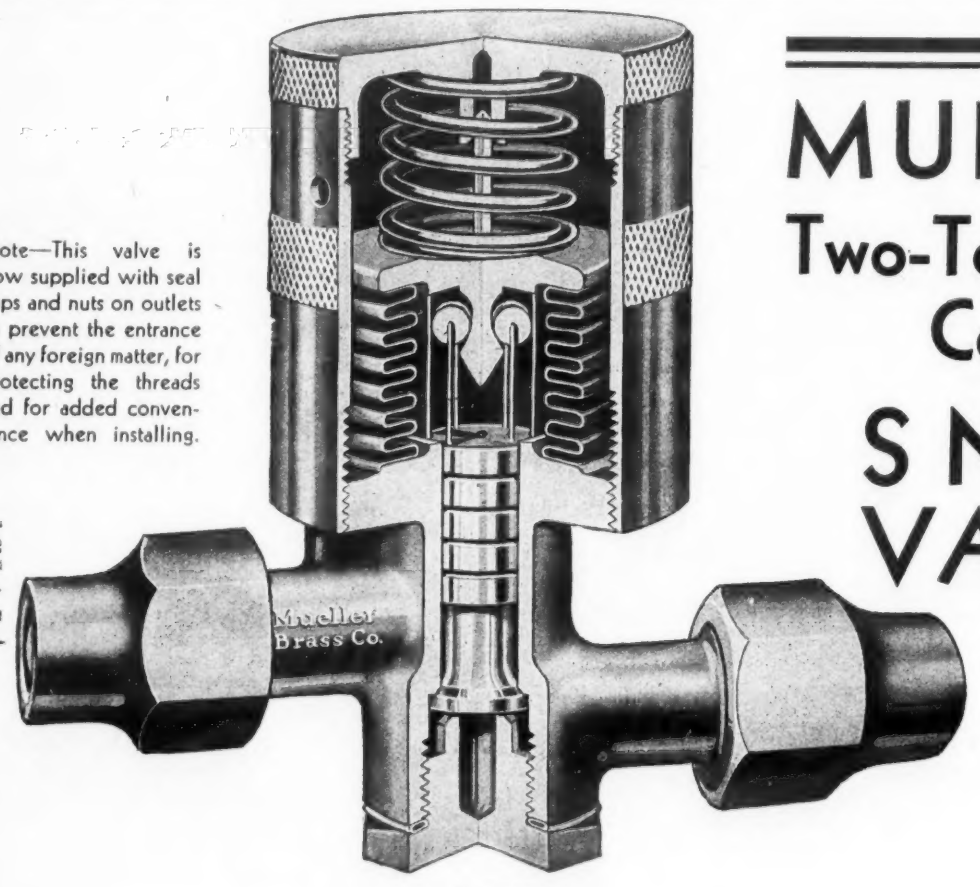
Certainly the number of fountains in any industry should not be less than one for each sixty to seventy-five employees, and the location of the fountains should be selected so that no employee would be forced to walk more than one hundred feet from his place of employment to reach a fountain.

It has already been mentioned that the prime consideration in the use of insulation on circulating lines and tanks is the saving of refrigeration. What this saving amounts to in terms of the expenditure for insulation cannot be estimated without an idea of the cost of producing refrigeration.

Summarizing, we may say insulation makes it possible to use smaller refrigerating equipment than is employed without insulation. Insulation reduces the amount of current required to operate the cooling equipment. Insulation prevents condensation and troublesome dripping from cold water lines.

Heat Transmission Table

Pipe Size, Inches	Capacity per Lineal Foot Standard Pipe in Pounds of water	Transmission in B. t. u. per Lineal Foot, per Degree F. Temperature Difference, per Hour		
		Ice Water Thickness	Brine Thickness	Bare Pipe
¼	.045	.101	.088	.340
⅜	.083	.114	.098	.406
½	.132	.132	.113	.485
¾	.231	.140	.120	.581
1	.375	.152	.129	.698
1¼	.648	.173	.135	.856
1½	.883	.187	.138	.960
2	1.455	.216	.158	1.160
2½	2.076	.257	.175	1.390
3	3.205	.273	.187	1.660
3½	4.286	.292	.199	1.860
4	5.519	.311	.231	2.060
5	8.673	.371	.250	2.490
6	12.524	.397	.285	2.900



Note—This valve is now supplied with seal caps and nuts on outlets to prevent the entrance of any foreign matter, for protecting the threads and for added convenience when installing.

1-2 S. A. E.

A-11095

MUELLER
Two-Temperature Control
SNAP VALVE

THIS valve is so constructed as to make it a real aid to the service man. By merely turning the outside knurled case he can raise or lower the temperature without danger of losing the differential which was previously properly set.

The differential is built into the valve and cannot be changed.

The temperature range may be changed without the necessity of a recheck or numerous visits of the service man. Simplicity of construction insures a long and trouble proof life.

The snap action feature prevents seat erosion and assures uniform performance.

The body is a brass forging, thus making it seep proof and free from defects.

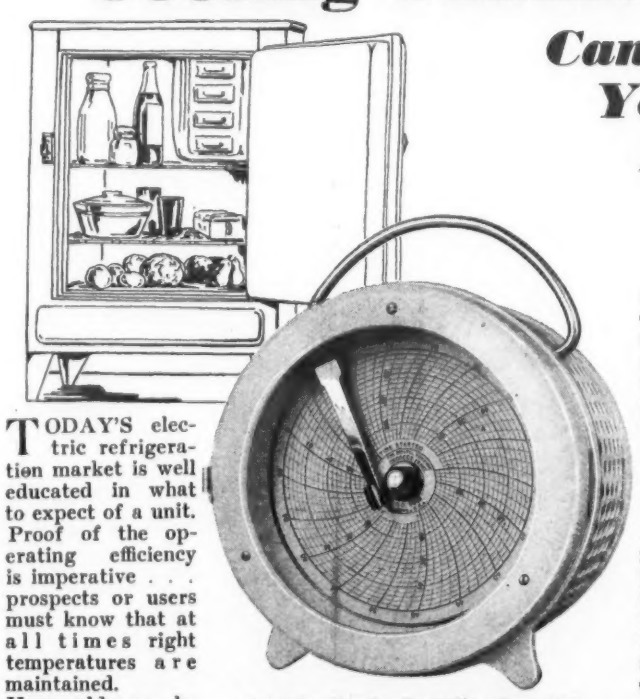
NOTE: WHEN ORDERING SPECIFY "CUT-IN" AND "CUT-OUT" READINGS.

Mueller Brass Co. Valves and Fittings are approved by the Underwriters' Laboratories of Chicago.

We manufacture a complete line of valves and fittings and can supply your every requirement.

Mueller Brass Co.
PORT HURON, MICHIGAN
THREE GENERATIONS OF BRASS MAKING

How Cool Is That Cooling Chamber . . .



Can You Really Tell?

TODAY'S electric refrigeration market is well educated in what to expect of a unit. Proof of the operating efficiency is imperative . . . prospects or users must know that at all times right temperatures are maintained.

How cold—can be answered emphatically by placing in the cooling chamber Bristol's Handy Recording Thermometer. This instrument, with the continuous 72-hour record, automatically records any variation in temperatures which occur, and writes the complete refrigeration story on the chart.

The Recording Thermometer furnished calibrated to use with chart having range of 30 to 70° F., has been found to be most suitable for refrigeration requirements. Instruments made up this way are carried in stock for prompt shipment. For further information, prices, see Bulletin No. 377.

Bristol's Handy Recording Thermometer for atmospheric temperature is 6 inches in diameter, uses 4-inch diameter chart. Case is aluminum alloy, white enamel finish.

THE BRISTOL COMPANY, WATERBURY, CONNECTICUT

Branch Offices: Boston, New York, Philadelphia, Birmingham, Pittsburgh, Akron

BRISTOL'S SINCE 1889
Instruments for Indicating Recording Controlling

Branch Offices: Chicago, Detroit, St. Louis, Denver, San Francisco, Los Angeles

CIRCULATING WATER SYSTEM DESCRIBED

By B. G. Hyatt
Copeland Engineer

CIRCULATING water cooling installations recently made in five Detroit telephone exchanges illustrate many of the principles of estimating cooling water requirements, selecting the equipment to do the job adequately, and installation methods. There are now nine of these exchanges equipped with the circulating water cooling systems in the state of Michigan.

The first thing we had to do was to determine the number of people to be served by each installation and the conditions under which each had to be installed. This meant determining the number of employes in each building and the number of transients who come in and out of the building every day.

From this we estimated the number of pounds of water that will be used during the regular hours, and calculated the amount of refrigeration that will be required to chill that amount of water to about 45° F. We find that this is the average temperature desired.

Medical authorities recommend temperatures ranging from 45° to 50° F. as being the most suitable from the standpoint of health and efficiency. Some doctors even recommend temperatures up to 55° or 57°, but ordinarily these latter temperatures are too high for practical purposes.

Water cooling capacities have to be figured very carefully and every possible waste of water taken into consideration in order to specify the proper amount and kind of equipment to be used. Each installation is usually a problem of its own. General rules are valuable only as guides.

Trained Installation Man

The person making the installation will naturally be a trained installation and service man, who understands the construction and principles of operation of the cooling systems, and from this knowledge and experience he must adapt the system to the individual requirements of the installation.

In the telephone buildings we have been using a large capacity water generator. These installations run from one-half horsepower on a 25-gal. water generator to one h. p. on a 100-gal. generator. The water generator consists of a vertical type pressure tank. Inside this tank are the cooling coils. Ice forms around these coils, cooling the water in the tank.

The water enters at the top of the tank and must pass over the ice formation around the coils before it is drawn off from the bottom. The temperature of the water is regulated by means of a thermostat control placed within the outlet water connection.

Water-Circulating System

These installations in which we have used the water generator are on a water-circulating system. That is, a circulating pump is connected in the ice water line in such a manner that the ice water is circulated to every bubbler so that as soon as the bubbler is opened, ice water flows instantly.

The following calculations which were used in determining the installations required will give an idea of how to go about determining the type, size, etc., of the equipment needed for a given job.

The amount of refrigeration necessary for cooling water depends upon three conditions:

First, amount of water required.

Second, temperature difference (tap water to outlet water).

Third, method of distribution.

The amount of water required depends upon the amount of water consumed and wasted, and upon the number of people drinking that water, as well as the occupation of the people. An office employe will use less water than a factory worker.

Heat Leaks Through Pipes

In a circulating type system, water is pumped to the various outlets. A certain amount of heat leaks through the pipes into the water, causing it to become somewhat warm and making recooling necessary. The pipes must be insulated with a good cork pipe covering, ice water thickness or its equivalent, in order to minimize the heat leakage into the water.

The temperature rise of the water depends entirely upon the thickness of the insulation used.

The following is an example used for calculating a circulating water system, such as installed in the Michigan Bell Telephone Company's buildings.

Assuming that the length of our circulating line will be 500 ft. of 1-in. line, insulated with ice water thickness cork covering, supplying 75 employes. Office workers consume and waste approximately ⅛ gal. of water per hour per person. This is approximately 10 gals. of water per hour.

10 x 8.3 (number of lbs. per gal.) x 30° (reduction) = 2490 B. T. U. per hour to cool the water drawn off at the various outlets.

Water must be circulated to carry away the heat that is absorbed by the line. Heat is absorbed through ice water thickness cork covering at the rate of .152 B. T. U. per lineal ft. per degree difference in temperature per hour.

The temperature difference in this case, we will say, is 30°, so the heat absorption for this line is

500 (ft.) x 30° (reduction) x .152 = 2280 B. T. U. per hour. Since one B. T.U. is required to raise the temperature of one lb. of water one degree and a 5° rise is allowed, this means that the quantity of water to be circulated is

2280 ÷ 5 = 456 lbs. per hour ÷ 8.3 lbs. (per gal.) is approximately 55 gals. per hour.

The total amount of water required is

10 gals. used and wasted

55 gals. circulated

65 gals. per hour, used, wasted and circulated. The total B. T. U. load is

2490 B. T. U. removal from water required

2280 B. T. U. line loss

4770 B. T. U. per hour (total)

4770 ÷ 144 (B. T. U. per lb. of refrigeration) = 33 lbs. of refrigeration per hour. This is 792 lbs. of refrigeration required in 24 hours.

In this case, with 70° water as a condensing medium, we would use a Copeland model X-1200-B condensing unit and a 100-gal. water generator.

We have also made some industrial installations in plants like those of the Ditzler Color Company and the Ex-Cell-O Aircraft & Tool Corp. of Detroit. These installations are of a smaller type of water cooling equipment where there are only two bubblers on each unit.

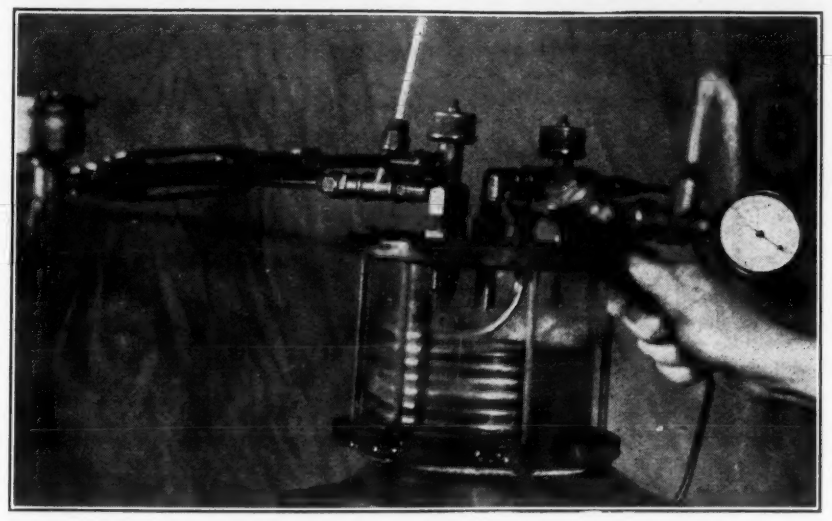
They are of the self-contained type, that is, the unit and cooler are all in one assembly. The Ditzler installation has been in service about three years, and the Ex-Cell-O coolers about one year.

We also have some of the smaller type of office coolers of both the bottle and city pressure type in use, but have not gone into these types of installation very heavily.

There is another job that we have just placed, in the new addition to Grace Hospital in Detroit. The dining room has a seating capacity for 144 people. We installed a ¼ h. p. condensing unit, and a 20-gal. water generator to handle the dining room requirements.

This installation is what is known as a "dead end" system. The water generator itself is placed close enough to the bubblers so that a circulating pump is not necessary. This equipment is handling their requirements very satisfactorily. The water, of course, is automatically controlled at the desired temperature.

Glass-Enclosed Temprite Demonstrator



A laboratory model of a Liquid Cooler unit is mounted inside of Pyrex glass so that its principles may be demonstrated. The experiment being conducted above to show how rapidly the cooler returns oil to the compressor when an over-dose of oil is used with methyl chloride. The model is mounted on a stand in the reception room.

A. S. R. E. Section Officers Named

New York City—Officers of the six metropolitan sections of the American Society of Refrigerating Engineers were recently announced by the main offices here.

Crosby Field, of the Flakice Corp., is president of the Brooklyn section; C. C. Thomas, of Kelvinator Corp., heads the Detroit section; O. A. Anderson, of Armour, the Chicago section; A. L. McMillan, of Kelvinator, the Philadelphia section; R. U. Fittz, of Tufts College, heads the group at Tufts College, Mass., and Fred Goes, of the Vilter Mfg. Co., is president of the Milwaukee section.

CLEVELAND STORE INSTALLING SYSTEM

Cleveland—D. P. Hoadly, chief engineer for the Cooling & Air Conditioning Co. of America, has announced that an air conditioning plant is being installed at the Higbee Co.'s new store now being erected in the Terminal group.

The main plant of the system, to provide conditioned air for the first floor, the mezzanine and the second floor, will be installed under the store concourse. Air will be poured into the building from vents hidden in the ceilings.

Smaller plants will be situated in other sections of the building where ventilation is inadequate.

The system, automatically controlled, will have a capacity of 600,000 cubic feet of air per minute.

REFRIGERATOR MAKERS USE 50,000 TONS OF STEEL

"ELECTRIC refrigerator manufacturers provide an outlet for 150,000 tons of steel annually as well as using considerable quantities of other metals and machinery," according to the March 5 issue of *The Iron Age*.

The growing consumption of steel is attributed to the fact that all-steel units are becoming more popular.

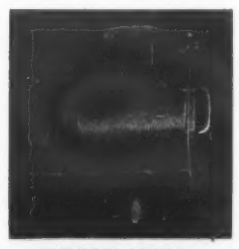
BILL IS DUMBFOUNDED

Cleveland—While installing a new electric water cooler back-stage of the State Theater here, servicemen connected it with the hot instead of cold water pipes.

A stagehand, Bill McCaffery, was dumbfounded, when he drank what he expected to be a good cold glass of water.

"EBCO"
AUTOMATIC SELF-CLOSING
STREAM CONTROL
VALVES

Squirting and waste of water are entirely eliminated—Complete control—automatically—of the stream height is assured under all fluctuating pressures between 20 and 120 pounds. Applicable to all types of drinking fountains.



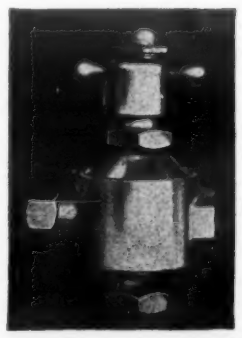
Saves Water

Eliminates Squirting

REGULATOR

for installation in water supply lines to present fountains 3-8 in. I. P. Inlet and Outlet.

Write for Complete Catalog of EBCO Valves and Drinking Fountains

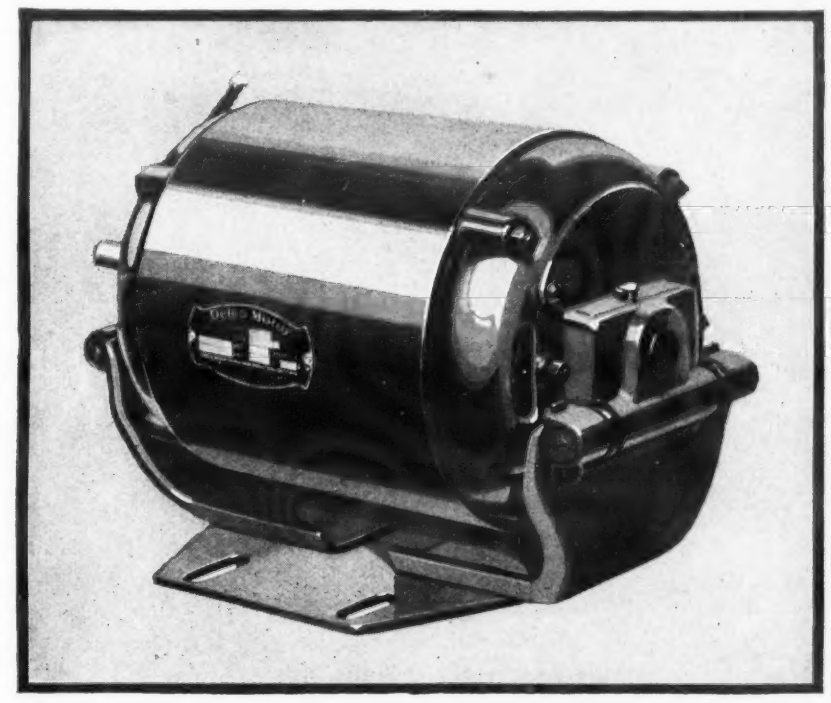


EXPOSED TYPE

Chrome plated union inlet—3-8 in. I. P. Outlet. C-1300 2-prong handle. C-1300 H 4-prong handle. C-1300 L Lever Handle

THE D. A. EBINGER SANITARY MFG. CO.
COLUMBUS, OHIO

Manufacturers of EBCO Drinking Fountains, Ventilated Urinals and Closets, Round Wash Sinks and Steel Compartments for Toilet Rooms.



A REFRIGERATOR MOTOR IS DIFFERENT

Delco provides a complete line of motors expressly designed and built to meet domestic refrigerator requirements. All are rubber-mounted in Delco's patented cradle—insurance against noise. All have Delco's simplified brush lifting mechanism. Every size has bronze bearings to protect the shaft—generous oil reservoirs—and thoughtful provision for convenient re-oiling. Yet Delco did not stop with refinement in design. Delco gives you tested quality in each unit, and provides for nationwide service through the comprehensive facilities of United Motors Service.

DELCO PRODUCTS CORPORATION, DAYTON, OHIO

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New Editorial Plans

IMPRESSED by the insistent demands for technical information which have appeared in subscribers' letters and renewal orders during the past year, the NEWS presents with this issue the first *Engineering Section*. A group of these comments appears in adjoining columns.

This section will be published in the same convenient size and easily-readable form which has always characterized the ELECTRIC REFRIGERATION NEWS. Merchandising and general industry news will appear in the white section, refrigerated food and commercial applications are the field of the yellow section, while the green section will be devoted to technical and engineering subjects.

The scope of the green section includes the following major topics:

1. **Patents**
2. **Designing**
3. **Production**
4. **Testing**
5. **Estimating**
6. **Installation**
7. **Inspection**
8. **Servicing**

Letters of commendation from readers indicate that in the past the patent pages have been well done. This service is to be extended and amplified.

New Designs

New designs are of keen interest and importance to the fast-growing electric refrigeration industry. Designs and specifications of new models are carefully watched by salesmen as well as engineers and executives who realize that the success of any mechanical venture is dependent on the engineering design on which it is founded.

In any highly competitive industry, production methods are of vital importance. The significant figure in a refrigerator manufacturer's profit and loss statement is always strongly influenced by the efficiency of his production system.

Testing represents an engineering activity which often calls for the services of laboratories which are independent of the manufacturer's control. The setting up of testing standards is a job for co-operative effort, and requires free discussion by all concerned.

Estimating is a part of the sales job, but it is the technically-minded man who must carefully compute the cost of a refrigeration installation. Commercial installations call for special care in estimating, because they often include several types and makes of equipment, each with different capacities and characteristics.

Under "Inspection" in the above list is included the application of municipal and other governmental regulations and safety codes.

Service Information

The service bugaboo is gradually being dissipated. Formerly, with selling influences in command of policies, any public mention of service was carefully repressed. However, the dawn is finally breaking, and manufacturers are seeing the value of providing complete information on servicing their machines.

It is conceivable that *one* mechanical contrivance like an electric refrigerator might operate indefinitely without service attention, but no one can deny that the 3,000,000 now in daily use are going to aggregate considerable service.

More than half of the refrigerators now in use were sold within the last two years, and many are still covered by guarantees. But all those sold previously have passed their guarantee period, so the market for service is just beginning to show up as a business opportunity. The existence of many "orphan" machines offers an open market which anybody may cultivate with little or no competition.

Independent Servicemen

The appearance of a large number of independent service companies throughout the country is a development of the past year. A sizable list of these companies is published elsewhere in this section.

Refrigerator manufacturers have been desirous of finding capable men to service their installations, and these service companies are anxious to learn improved service remedies and where to obtain parts and supplies. We believe this medium can be helpful to both interests.

Refrigerator manufacturers have been desirous of finding capable men to service their installations, and these service companies are anxious to learn improved service remedies and where to obtain parts and supplies. We believe this medium can be helpful to both interests.

We plan to make this section a forum of discussion on technical refrigeration topics. Pertinent comments and opinions on subjects outlined above are invited from the numerous engineering readers of the ELECTRIC REFRIGERATION NEWS.

GLEANINGS
FROM CURRENT PERIODICALS

Because of the convenience attending the handling of solid milk, many attempts have been made for producing frozen milk on a commercial scale, but until recently most of them have failed because of the separation of the various constituents of the milk in the order of their freezing points. In the new process now being tried in England, this difficulty has apparently been overcome and is being tried out.

In short, this consists of pre-cooling the milk to about 40 deg. F., as is now common practice, and then homogenizing it under a pressure of about 6,000 lbs. per square inch, the homogenized product finally being rapidly frozen. The frozen, homogenized milk is packed in non-returnable paper cartons, thus avoiding a costly outlay in bottles, bottle collecting, bottle washing and sterilizing. Adulteration will be impossible after the milk has left the plant, with less opportunity of contamination.—*Cold Storage.*

Estimates that the 1930 production of carbon dioxide ice in the United States will equal the total liquid production of carbon dioxide in 1927, indicate the rapid strides in the commercial development and use of that commodity since its arrival in the field of refrigeration and preservation a few years ago, according to an oral statement by C. C. Concannon, chief of the Chemical Division, Department of Commerce.

While the uses of this comparatively new refrigerant have not been very widely exploited as yet, it is opening up a new field in methods of refrigeration, preservation and the transportation of food products, it was stated.

The following information was made available by the Chemical Division:

Although the use of carbon dioxide ice is promising for refrigeration in new fields and in supplementing other refrigerating methods, thus far it has not seriously entered into competition with water ice. The development of efficient productive and distributive facilities, in addition to the devising of appropriate refrigerators, are the chief problems to be met before carbon dioxide ice can enter into home refrigeration on a commercial scale.

The commercial development of carbon dioxide ice has taken place within the last five years. Its unusual reserve refrigerating power and the basic principles upon which it can be made from carbon dioxide gas have been known for scores of years, but its economic utility has only recently begun to be appreciated by industries and the public in general.—*Siebel Technical Review.*

Half of the production equipment in the United States ought to be replaced by modern machinery, and the sooner it is replaced the better.

I think that the great majority of level-headed students of this subject view the machine as a liberator. They see it creating wealth—and not for the few alone. They recognize its prime responsibility for the rise of giant industries concerned with a vast array of new conveniences and comforts. They are grateful to it for lifting much of the age-old burden of grinding labor from the bent backs of the toilers. They conceive it as a source of unprecedented wage scales.

The activities which have ramified endlessly from the new machine-driven industries, the new jobs, especially in the so-called "service occupations," that have been brought into being by higher standards of living should eventually take care of practically all the men and women displaced by the machine. New wants, new needs for ever-varied service sprout with amazing luxuriance from the soil of the machine age.—*Julius Klein*, Assistant Secretary of Commerce.

'I Want To See More News About:'

Insulation for commercial refrigerators—J. T. Garland, 254 Lucas Ave., Kingston, N. Y., with Lorillard Refrigerator Co.

Service and out-of-the-ordinary installations—A. B. Teale, 136 S. Dartmouth St., Kalamazoo, Mich., with C. Chas. Ross Co., Zerozone distributor.

More news about service—Community Oil Burner Co., 230 W. Main St., Belleville, Ill., Ice-O-Matic distributor.

Tubing and tubing problems—Bundy Tubing Co., 4815 Bellevue Ave., Detroit, manufacturer.

Service work—Guy Pohlman, 9431 Muriel St., St. Louis. Norge serviceman.

Possibilities in the field for factory-trained men—G. R. Simm, 2 Lindin St., Schenectady, N. Y., General Electric serviceman.

Progress of companies in the air conditioning and room cooling field—G. C. Davis, 509 E. Jefferson Ave., Ann Arbor, Mich., student of refrigeration at the University of Michigan.

Information for the serviceman—F. O. Broili, Reno, Nevada, with Nevada Machinery & Electric Co., Servel and Electrolux distributors.

Details of construction of different machines—Albert Wright, 700 Second Ave., San Francisco.

Comparative tests of insulation—Walter C. Myers Co., 311 N. Third Ave., Minneapolis, Ligonier dealers.

Manufacturing chemistry, technical problems, new applications of units, new refrigerants, articles on manufacturing—Jos. J. Vetter, Howland Ave., Hackensack, N. J., chemical engineer with Natural Products Refining Co.

Service; it seems most of the paper is taken up with new distributors of different types of machines—Frank A. Parker, 204 State St., Merchantville, N. J., selling Kelvinator and Welsbach refrigerators for Public Service Electric & Gas Co.

Difficult service problems — J. R. Mattes, 5114 Craig Ave., Baltimore, with Grovans Electrical Refrigeration Service.

Design and production problems, you give too much space to sales—G. W. Gail, P. O. Box 35, Ruxton, Md., with Silica Gel Corp.

Special installations—Way Engineering Co., 1303 Lamor St., Houston Tex., distributors for General Refrigeration Co.

Refrigeration service companies—Karl G. Frese, Mercerville, N. J., with Frezon Refrigeration Service Co.

Methyl chloride systems—Ice Machine Service Co., 110 N. E. Ninth St., Miami, Fla., Servel distributor.

Better service—J. W. Carroll, 404 W. Garden St., Pensacola, Fla., Frigidaire serviceman.

Servicing and overhauling ice cream cabinets—A. R. Lind, Box 373, Fords, N. J., serviceman with Castles Ice Cream Co.

Refrigeration ordinances and new enforcement—Bureau of chemistry and food health department, Baltimore.

The serviceman—M. D. Sterzik, 207 S. Sixth Ave., Maywood, Ill., serviceman with Electric Refrigeration Co.

Independent service, I have been running an independent service station in this territory successfully for two years—D. D. Parshall, Stamford, Conn.

Service on various makes of machines, less sales information on G-E, Frigidaire, etc.—Morris Rowitzer, 100 E. 167th St., Bronx, N. Y., serviceman with Welsbach Gas Lamp Co.

Means of increasing sales, viewpoints of successful salesmen, service, service salesmanship, tact in handling customers—E. A. Dunham, Jr., 215 Ritgers Place, Nutley, N. J., Electrolux engineer and salesman.

Water cooling, office cooling, and room cooling—R. R. Koepsell, 800 S. Sixth St. W., Cedar Rapids, Ia., serviceman with Iowa Railway & Light Corp.

Engineering problems—William Robertson, 409 Woodward Ave., Brooklyn, N. Y., New York, service manager of Bishop & Babcock Sales Co.

Service troubles and their remedies, particularly sulphur dioxide and methyl chloride—W. J. Menzies, 828 S. West St., Apt. 7, Syracuse, N. Y., road serviceman with Kelvinator Syracuse, Inc.

New Majestic refrigerator specifications—Marvin B. Guenther, 191 Eighth St., Fond du Lac, Wis. with Miller Automatic Services, Frigidaire distributor.

Helps to the serviceman—Howard Schnese, 1001 Seventh St., Milwaukee, Wisc., Servel serviceman.

Manufacturing, installation, and servicing refrigeration equipment — Christian G. Hess, 321 Everett Ave., Scranton, Pa.

Engineering problems in both household and commercial lines—A. A. McCormack, Research Engineering Department, Frigidaire Corp., Dayton.

Service, installation and design—Rice C. Kennedy, 1517 Marshall, Apt. 2, Shreveport, La.

Compressor designs—A. F. Sawyer, chief engineer, Irving L. Keith, Box 667, Haverhill, Mass.

Service and installation problems—F. E. Hershey, 7007½ Willoughby, Los Angeles.

Air cooling and air conditioning—L. T. Avery, 2036 East 22nd St., Cleveland.

The service end of the industry—C. C. Norton, 3661 Summer Ave., Memphis, Tenn.

Ammonia machines—Florida Ice Machinery Corp., 808 W. Bay St., Jacksonville, Fla.

Factory production methods, service—Roy McLaughlin, 856 Wayne Ave., York, Pa.

Installation and service of commercial jobs—S. J. Sardis, Purity Ice Cream & Candy Co., Clarksville, Tenn.

Service and maintenance—E. E. Martin, 631 Lincoln, Fresno, Cal.

Refrigeration patent news—E. W. Atwood, 312 Genesee Bank Building, Flint, Mich.

Details of commercial installations, service news, coil winding, etc.—O. A. Remington, 8900 S. St. Andrews Place, Los Angeles.

Absorption type refrigerators, and service helps—H. H. Roth, 422 W. Walnut St., Boonville, Ind.

Hints on service problems—J. W. Wilderman, 4028 47th Ave. S. W., Seattle, Wash.

All service news is interesting—Robert G. Squier, 709 Kenzington Ave., Plainfield, N. J.

Spare parts—Charles Kemp, 927 Laurel Ave., Los Angeles, with Kemp's Electric Refrigeration Service.

Service problems—Frank Ryan, Box 524, Joplin, Mo.

Technical data on refrigeration equipment from frozen foods—Iddo W. Lampton, Kelvinator Mobile Co., Mobile, Ala.

Service problems and their solutions—Miller Seddon & Co., 308 Massachusetts Ave., Cambridge, Mass.

Servel commercial installations, miscellaneous marine installations—J. W. Rubenson, P. O. Box 3020, Honolulu, engineer with Theo. H. Davies Co., Ltd.

Advancement of refrigeration, new uses, adaptations, etc.—Chas. W. Wilmes, 4243 Shreve Ave., St. Louis, with service department of the Del-Home Light Co.

Service—R. E. Orr, 1352 Finley N. E., Atlanta, Ga.

Commercial installation and engineering problems—Raymond Gill, Route 8, box 253, Portland, Oregon, engineer with Frigidaire Sales Corp.

Service department problems—Everett E. McGuire, 309 E. Farnum Ave., Royal Oak, Mich., serviceman with Liquid Carbonic Corp.

Application of dry ice—Geo. Balcore, 103 Thaver St., New York City, serviceman with Liquid Carbonic Corp.

Service and installation—Brand & Venters Electric Refrigeration Service, 416 Baswood St., Jacksonville, Fla.

Service problems and kinks—F. R. Burkhardt, 261 Ninth Ave., Bethlehem, Pa., serviceman with Meyer Dairy Corp.

Code enforcement written by men who know refrigerating machinery, men taken from the industry and appointed on qualification—Herbert Treganowan, 2617 Halperin Ave., Bronx, N. Y., engineer with Lyon, Cowdrey & Despart.

Service troubles—Arthur W. Raynor, 42-12 190th St., Auburndale, Flushing, L. I. Frigidaire serviceman.

Service—keeping the refrigerator sold—C. C. Norton, 3661 Summer Ave., Memphis, Tenn.

Manufacturing plant conditions—Rolf M. Smith, 135 Cambridge Ave., engineer with Frigidaire Corp.

Apartment house installations, and city and state safety codes that have been adopted in different sections of the country—A. S. Kosser, 535 E. 110th St., Cleveland, salesman with Cushman Refrigeration Co.

Engineering news—L. A. Tucker, 518 Monroe Ave., Ardsley, Pa., engineer with J. J. Podock, Inc., Philadelphia.

Latest design and construction of refrigeration equipment—H. O. Bean, Rural Route 1, Minneapolis, manager of Simplex refrigerating Fixture Co.

Articles on the ways and means of better installations, pictures and descriptions—Henry H. Hauer, 194 Locust St., Milwaukee, Wis., contractor.

Engineering and service features—H. F. Newport, 1713 W. 69th St., Cleveland, serviceman with the Danforth Refrigeration Co.

Service and sales engineering—C. J. Hinkle, 3714 Noble Ave., Dallas, Tex., serviceman with Jackson Bros.

The NEWS is now one of the best trade papers I have ever read. Just a little more on the subject of service would suit me fine—Edwin J. Uhthoff, 72 V St. N. W., Washington, D. C., servicing all kinds of refrigerators.

Easy and helpful service helps which have been used in the field—Kenneth Priestly, 9 Bailey Ave., Ridgefield, Conn., serviceman with C. W. Riedenger.

Mechanical features—J. C. Speicher, 600 Fourth St., Braddock, Pa., serviceman with Loew & Quinn.

Descriptions of the mechanism of new models and service hints—Fred B. Harlin, Itasca, Tex., servicing all types of refrigerators.

Water Cooling Accomplished By Four Different Methods

(*Concluded from Page 1, Column 5*)

the cooling water flows. The direct method has the evaporator in direct contact with the water to be cooled.

The circulating system is the oldest method of installation. It has greatest use in very large office and hotel buildings where one management provides cooled water in hall bubblers, hotel washrooms, and similar cold water taps provided for tenants.

The circulating system consists of a loop of one to two-inch insulated piping through which cold water is circulated by means of a centrifugal pump. The cooling is accomplished by refrigeration equipment usually located in the basement, and operated in connection with an insulated cold water storage tank.

At suitable intervals around the loop, taps are taken off from which cooled water may be drawn. Any waste water is allowed to drain to the sewer. After the water has passed through the loop, it is again returned to the water cooling tank. Here fresh filtered water is added from city mains, and it is again cooled and recirculated.

The multiple system differs from the circulating system primarily in that instead of circulating water throughout the building, the refrigerant itself is circulated to cooling tanks in the water coolers. This plan is practically a water cooling application of an apartment house domestic refrigerator installation.

Each cooler is connected to a water pipe, and provision made for draining waste water from each cooler to the sewer. Its features are that much less plumbing and insulation are necessary, and that the heat losses from long circulating water lines are avoided.

Individual self-contained coolers are very popular in private offices, restaurants, stores, banks, and factories. In this type, the cooling unit and water outlet are mounted in a cabinet with the refrigerating equipment in the base. Connections are made to the water supply, a drain, and an electrical outlet.

Figuring the cooler size necessary for individual self-contained units is a fairly simple matter. Assuming a light manufacturing plant with 30 employees, with a tap water temperature of 70 deg. F. to be cooled to 50 deg. F., from the table 1 below the usage will be:

30 x 1/5 = 6 gals. per hour.

These requirements could be met, for instance, by one General Electric DP-1 pressure cooler, whose capacities are shown herewith:

Water Cooling Capacity
G-E DP-1 Pressure Type Cooler
(Bubbler Service Only)

Tap Water Temperature	Gallons of Water Delivered per Hour
90	4.0
80	5.0
70	7.0
60	10.0

Requirements for a dead-end system are figured on a basis similar to a circulating water system. Engineers of the Universal Cooler Corp. illustrate this with an office building with an outlet on the first floor hallway, and another on the second, supplying 50 regular office employees and 125 transients. From Table 1, the usage of the employees will be:

50 x ⅛ = 6.25 gals. per hour, and the transient water usage will be:

125 ÷ 100 x 1 = 1.25 gals. per hour, so the total usage will be 7.5 gals. per hour. If the inlet water is 90 deg. F. to be cooled to 50 deg. F., their compressor capacity tables show that their ½ h.p. air cooled unit will handle the installation.

WATER COOLING DATA

Table No. 1—Water Cooler Usage

The amount of cooled water required in different classes of installations can be determined with a reasonable degree of accuracy from the following data:

Class of User	Proper Temperature of Cooled Water	Amount of Water Consumed and Wasted
Office Building		
Regular Employees	50°	⅛ gal. per hr. per person
*Transients	50°	1 gal. per hr. each 250 people per day
Manufacturer		
Light	50° to 55°	1/5 gal. per hr. per person
Heavy	50° to 55°	¼ gal. per hr. per person
Restaurant		
Table Service	45° to 50°	1/10 gal. per person served
Cafeteria		
Service	45° to 50°	1/12 gal. per person served
Hotels	50°	⅛ gal. per hr. per room, maximum 1½ gals. per day
Theatres	50°	1 gal. per hr. for each 75 seats
Retail Stores	50°	1 gal. per hr. for each 100 customers per hour
Schools	50° to 55°	⅛ gal. per hr. per student
Hospitals	45° to 50°	1/12 gal. per hr. per bed, plus ⅛ gal. per hr. per attendant

*Total number of people entering and leaving office building per day over and above office employees.

Table No. 2

Water cooling equivalent of heat leakage in 100 ft. of cork insulated pipe in gals. per hour:

Room Temp.	WATER COOLED FROM 60° to 50°	70° to 50°	80° to 50°	90° to 50°	100° to 50°
70°	3.5	1.8	1.2	0.9	0.7
80°	5.3	2.6	1.8	1.3	1.1
90°	7.1	3.5	2.4	1.8	1.4
100°	8.9	4.4	3.0	2.2	1.8
110°	10.6	5.3	3.5	2.7	2.1

Table No. 3

Water Cooling Data

1 Cubic Foot of Water equals	1,728.00 Cubic Inches
1 Cubic Foot of Water equals	62.50 Pounds
1 Cubic Foot of Water equals	7.48 Gallons
1 Gallon of water equals	231.00 Cubic Inches
1 Gallon of Water weighs	8.35 Pounds
1 Gallon of Water cooled 1° F. gives up	8.35 B. T. U.
1 Gallon of Water cooled 10° F. gives up	83.50 B. T. U.
1 Gallon of Water cooled 20° F. gives up	167.00 B. T. U.
1 Gallon of Water cooled 30° F. gives up	250.00 B. T. U.
1 Pound Pressure equals	2.30 Foot Head
1 Foot Head equals	0.34 Lbs. Pressure

Table No. 4

Friction of Water in Pipes

Loss of head in feet due to friction, per 100 feet of smooth, straight iron pipe, when pipe is slightly rough, add 15 per cent. When very rough, add 30 per cent.

Vel.—Velocity feet per second. Fric.—Friction head in feet.

Gal. Per Min.	½" Pipe Vel.	½" Pipe Fric.	¾" Pipe Vel.	¾" Pipe Fric.	1" Pipe Vel.	1" Pipe Fric.	1¼" Pipe Vel.	1¼" Pipe Fric.	1½" Pipe Vel.	1½" Pipe Fric.
1	1.05		.60							
2	2.10	5.30	1.20	1.40						
3	3.16	11.30	1.80	2.90	1.12	0.90				
4	4.21	19.20	2.41	5.00	1.49	1.52	0.86	0.40	0.63	0.187
5	5.26	29.00	3.01	7.50	1.86	2.32	1.07	0.60	0.79	0.283
10	10.52	105.00	6.02	27.10	3.72	8.40	2.14	2.18	1.57	1.02
15			9.02	57.00	6.13	18.90	3.92	4.65	2.72	2.25
20			12.03	97.00	7.44	30.10	4.29	7.90	3.15	3.70
25					9.30	45.50	5.36	11.90	4.56	5.60

Note: 1—90° Elbow is equal to three feet of straight pipe.

ATOMIZING FEATURED IN COPE-SWIFT OIL BURNER

Detroit—The new model Cope-Swift oil burner is now in production and is being merchandised on a national scale in a million dollar campaign arranged in co-operation with Holmes, Inc., 807 Stephenson Bldg., Detroit, according to an announcement by C. B. Swift, president of Cope-Swift Corp.

The feature of the new model is the atomizing of the oil by heat and centrifugal force combined, by means of a Triplex cup mounted on the fan assembly, the oil being fed through the hollow shaft. The oil comes through the shaft against a cone heated by exposure to the flame.

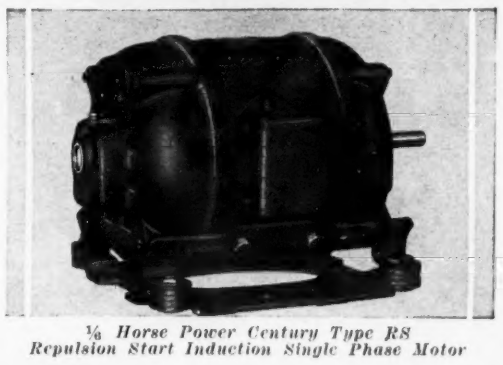
Cracking is started by the heat and the oil passes backward through a nozzle with large holes to prevent stoppage. Centrifugal force then spreads it in a thin layer around the inner walls of the first cup, from which it is thrown to the second. Here a still thinner layer is struck by hot gases which are drawn through the third cup.

As it is thrown in the form of a mist or fog from the edge of the cup, it is picked up and projected into the flame by the air current driven through the outer housing by the fan.

The burner unit, which includes the Triplex cup, the motor and the fan, all mounted on the single hollow shaft, is the only moving part of the burner. The motor assembly is mounted on a cast iron plate to be attached to the ash pit door frame, patented rib-sections permitting it to be fitted to any size opening.

The new burner has full standard electric automatic controls. Present equipment is with Mercoid solenoid electric oil valve, stack safety control, room thermostat and pressure safety control, all operated on a standard 110-volt circuit.

THEY KEEP A-RUNNING



⅛ *Horse Power Century Type RS Repulsion Start Induction Single Phase Motor*

RUBBER MOUNTED
FOR QUIET OPERATION

Where noise and vibration must be kept at a minimum and localized—as in electric refrigerators, oil burners and similar installations—the combined advantages of both spring and rubber mounting provided by these motors makes them particularly suitable. . . . The quiet operation of Century Type RS Motors is further assured because they are of the brush-lifting type—the brushes ride the commutator only during the starting period; about 1/900th part of the time the motor is in operation.

Century Repulsion Start Induction Single Phase Motors are built in all standard sizes from ⅛ to 40 horse power.

CENTURY ELECTRIC COMPANY
1806 PINE ST. - - ST. LOUIS, MO.

40 U. S. and Canadian Stock Points and More Than 75 Outside Thereof

Century MOTORS
FOR MORE THAN 27 YEARS AT ST. LOUIS

TEMPRITE
Influence Grows
In the Liquid Cooling Field

THE past year has been a year of remarkable growth for the Liquid Cooler Corporation. In the brief span of twelve months *Temprite Coolers* have been introduced to and accepted by most of the leading manufacturers of products that require water or beverage cooling equipment. Leaders of the soda fountain industry, the dispensed beverage manufacturers and other industries, such as bottling plants, bakeries, fur storage firms and florists have tested and in many cases are using *Temprites* as standard equipment. The widespread acceptance of *Temprite Coolers* can be directly accredited to the numerous outstanding characteristics of performance and design:

——The *Temprite* line includes 17 different, distinct models covering the entire range of liquid cooling applications. Each *Temprite* is expressly designed for the job it is intended to handle.

——*Temprite*, the original Instantaneous type cooler, has proved itself in principle, design and performance.

——*Temprite* compact construction has permitted manufacturers of cabinets, cases, etc., to save for more profitable use much valuable space.

——*Temprite's* principle or method of heat transference is responsible for positively controlled exit temperatures—a desirable and profitable feature in any liquid cooling application.

——The fact that *Temprites* may be duplexed with other low temperature equipment, without using two temperature valves, has opened a vast market to distributors and dealers.

——The low initial and installationcost of *Temprites* has meant much to hundreds of purchasers.

LIQUID COOLER CORP. DETROIT, MICH. U. S. A. TEMPRITE LIQUID COOLING DEVICES PATENT NO. 1,675,103 OTHER PATENTS PENDING

Electric Refrigeration Distributors are invited to write for information on the complete "Temprite" line.

LIQUID COOLER CORPORATION
Orginators of Instantaneous Liquid Cooling Devices
6527 RUSSELL STREET * DETROIT, MICHIGAN
West Coast Distributors, Refrigeration Products, Ltd.,
1110 N. Alameda Street, Los Angeles, Calif.

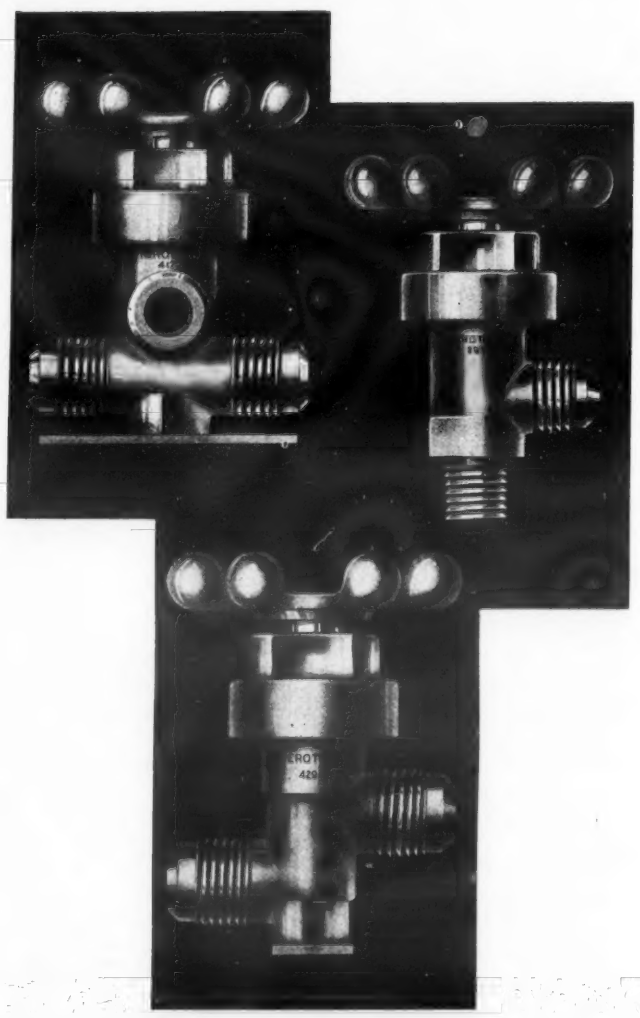
KEROTEST

KEROTEST

introduces

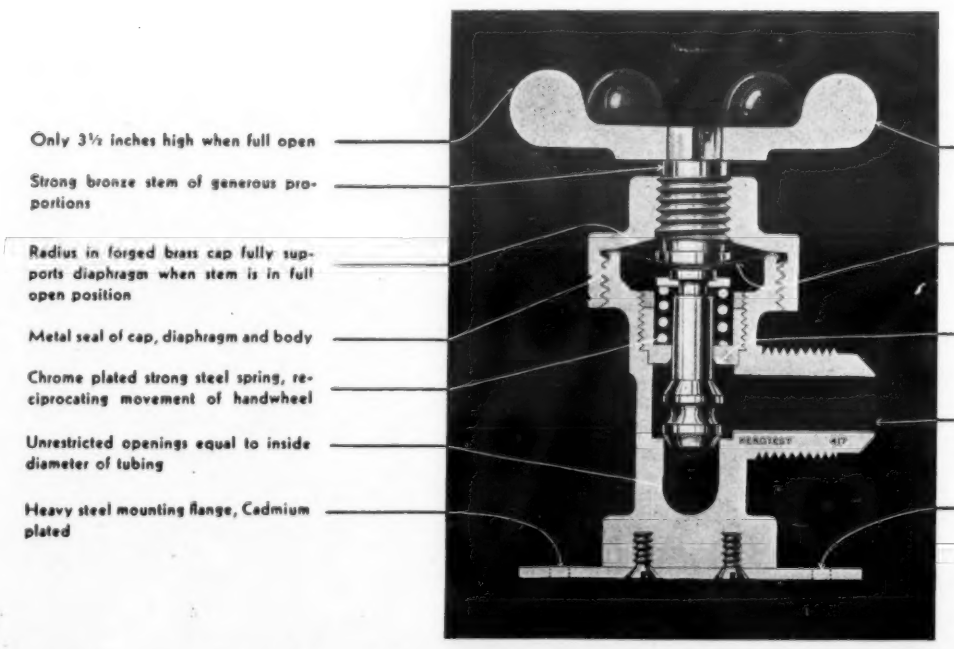
MULTIPLE DIAPHRAGM TYPE

REFRIGERATION VALVES



A revolutionary development in design and construction of brass valves for refrigerator service . . . the multiple diaphragm . . . of monel metal . . . impervious to all refrigerants . . . replaceable with valve under pressure.

Get the facts and prices today from your nearest Kerotest distributor.


Only 3½ inches high when full open
Strong bronze stem of generous proportions
Radius in forged brass cap fully supports diaphragm when stem is in full open position
Metal seal of cap, diaphragm and body
Chrome plated strong steel spring, reciprocating movement of handwheel
Unrestricted openings equal to inside diameter of tubing
Heavy steel mounting flange, Cadmium plated
Large handwheel specially knobbed for firm hand grip
Multiple Monel Diaphragm impervious to all refrigerants—replaceable with valve under pressure
"Pressure tested" metal to metal back seat when stem is in full open position
Maximum size ½-inch S.A.E. on all 3 openings
Holes in mounting flange accessible for attachment in shallow knockout boxes

KEROTEST MANUFACTURING CO., PITTSBURGH

DISTRIBUTORS

Detroit, Mich., 6-247 General Motors Bldg. W. H. Mark Hanna
Los Angeles, California, 224 East 11th Street Van D. Clothier
San Francisco, Calif., Merchants Exchange Bldg. A. W. V. Johnson
Philadelphia, Pennsylvania, 523 Arch Street Fretz Brass & Copper Co.
St. Louis, Missouri, 2817 Laclede Avenue Brass & Copper Sales Co.
Chicago, Illinois, 2317 W. Marquette Road G. C. Taylor
Boston, Massachusetts - - 110 High Street A. E. Borden Co.
New York City, N. Y., 958 Graybar Bldg. Kerotest Manufacturing Co.
Newark, N. J., Jefferson and Chestnut Sts. McIntire Connector Co.
New York City, New York, 116 Broad Street Melchior Armstrong, Dessau Co., Inc.

Bred on Methyl Chloride

The three puppies and their mother were fed on food and water saturated with methyl chloride by the Bureau of Mines, Pittsburgh. The parents of the puppies lived on the diet for 171 days without bad effects.

* * *

N.A.P.R.E. NAMES OFFICERS, DISCUSSES FROZEN BRINE

New York City—Frozen brine was discussed by Clifford F. Holske, of the American Ice Co. at a meeting of the National Association of Practical Refrigerating Engineers, held here recently. The speaker was introduced by Gustav L. Beinert.

Officers elected at this meeting were: Gustav L. Beinert, Beinert's Ice Co., Inc., Tottenville, Staten Island, N. Y., president; C. George Wood, 25 West Broadway, N. Y., secretary-treasurer; Charles H. Herter, Flakice Corp., Newark, N. J., Chairman Educational Committee.

DRYERS CUT CORROSION IN EXPANSION VALVES

WHENEVER an expansion valve is removed from a portable ice cream cabinet and found to be corroded due to moisture, or shows indications of moisture in the system, a new refrigerant dryer must be installed. If a new expansion valve is installed or the old one overhauled and replaced without using a new dryer, the expansion valve will again become corroded.—Kelvinator Service News.

No Poisoning Found

Pittsburgh.—Two dogs were fed a diet of methyl chloride saturated food and water for a period of 171 days by the research workers in the Pittsburgh Experimental Station of the Bureau of Mines.

The experiment was conducted to determine the possibilities of methyl chloride poisoning by ingestion with food and water, under a co-operative agreement between the Bureau of Mines, the Department of Commerce, and the Roessler & Hasslacher Chemical Co. No symptoms of poisoning were found.

After the dogs had been under these conditions for 105 days, a litter of three puppies shown above, were born. Although the parents were killed for examination, the puppies are alive and thriving.

HURD WILL HANDLE TESTING INSTRUMENTS

Chicago—Porter Hurd has been appointed representative in eastern Pennsylvania, southern New Jersey, Delaware and Maryland for the Illinois Testing Laboratories, Inc., of Chicago.

He will handle the I. T. L. line of measuring instruments for industrial purposes.

SERVICEMEN FACE VARIED PROBLEMS

By Arch Black

AS the refrigeration industry grows older, each year has seen a new application for the equipment. This demand has made it necessary that the various manufacturers produce new types of cooling units until today there is a demand for larger commercial installations with the various forms of equipment.

These new applications have made an increased demand on service and installation departments; so much so, that the service man of today has to handle about as many different types as a doctor has diseases to diagnose.

Take a few of the types of installations that a service man must know about—self-contained, remote, multiple installations, domestic, apartment houses, grocery, butcher shop coolers, display cases, florist boxes, fur storage, ice cream cabinets, salad pans, water coolers for office, home and factory, milk cooling, storage, circulating, storage and direct water cooling, beverage coolers, etc. These installations may be of the expansion or flooded type system or both.

The Doctor and the Serviceman

The doctor has the advantage over the service man, as he can tell his patient that he has the latest fashionable disease, or send him to the hospital for observation. The service man doesn't get that chance, for the customer wants the equipment fixed now or he threatens to throw it out (if it hasn't been all paid for).

The service man usually has to meet users at their worst and quite often is required to resell a job. This makes another important qualification for the service man. He must be a diplomat.

Service is not always caused by factory fault nor poor service men, and a great deal of the heavy demand on service could be eliminated if more attention was paid to the capacities and installation instructions that are sent out by the manufacturers of the various types of equipment.

Commercial refrigeration is no guess-by-luck-business. It requires thought, study and good judgment. Thought should be given when the sale is made. There are always certain factors that must be considered. Study the load! Is the usage light or heavy? It is not good judgment to specify a 1½ hp. condensing unit when a ¾ hp. will take care of the load.

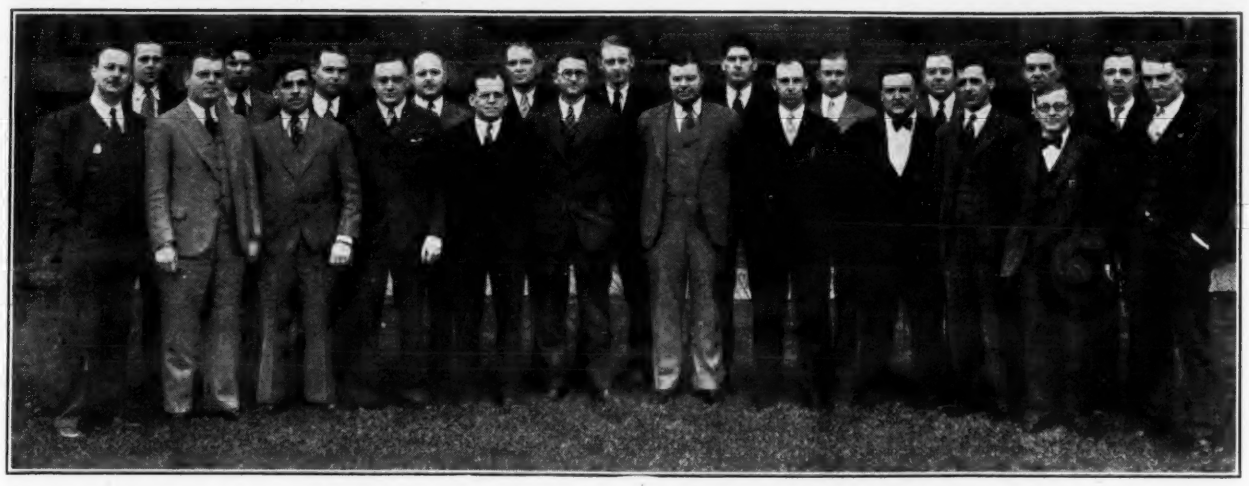
Load Factor Important

Nor yet is it correct to figure the temperature difference from average summer temperature of 90 deg. F. if the refrigerator is located in a hot kitchen where the temperature will reach 120 deg. F. A different load factor is necessary when specifying equipment for a cooler that has fresh killed meat stored in it and one that has chilled packing house meat.

Many may think that these are exceptional cases but they are not by any means. Just how many failures are blamed on liquid cooling equipment? Is it the water cooler's fault if it has been installed where the demand is for 20 gals. per hour, exit temperature to be 40 deg. F., if the cooler's capacity is only 15 gals. per hour at 45 deg. F.

(Concluded on Opposite Page)

Students at Electrolux Service School



Above are some of the students who studied the maintenance of gas refrigerators in the two-week factory service school conducted by the Electrolux Refrigerator Sales, Inc.

* * *

SERVICE MANAGER GIVES PRACTICAL SUGGESTIONS

(Concluded from Opposite Page)

exit? Again, is a 20 g. p. h. cooler capable of delivering 40 deg. F. exit temperature at fault if the condensing unit has only a 10 g. p. h. capacity?

It is not poor equipment when the cooler fails to deliver the desired temperature at the bubbler when the water has been stored in a dead end line 50 ft. long and the line not insulated.

Should the cooling equipment be condemned if the water temperature into a factory is 70 degrees F. and the supply line to the coolers is then run near or alongside steam pipes thereby raising the temperature so that the water entering the cooler is 120 deg. F.? "And so far into the night," could questions be put and answered. The service demand could be cut, and condemned cooling equipment would be rectified by proper installation.

Service knowledge should be built up from studying the type of system, rather than by merely noticing whether the installation is a water cooler or a grocery box. If a call is made on a water cooler, the service man should go to the job with the full knowledge that if the water cooler is of the flooded type the trouble will show up just as it would in any other flooded system.

It is essential that the service man's thermometers and gauges be correct. A great many additional calls are made because of incorrect readings from incorrect thermometers and gauges. Many service men do not study pressures, and get into the habit of thinking that if it isn't motor trouble then the system is either short of refrigerant or has too much.

One man arrives on the job and adds a little refrigerant. The next day the other fellow comes and takes it out, leaving the system shorter of refrigerant than it was when the first man came on the job. So it goes until the result is condemned equipment.

The refrigerant charge should be determined the first time the system is started. Don't guess. Make sure that one or more boilers have sufficient refrigerant to close the float needle and then check the receiver charge. See that the pressures indicated at the gauges are normal.

Don't expect, when the back pressure reads 20 lbs. of sulphur dioxide pressure, to find that the exit liquid temperature is 40 deg. F., for it cannot be that temperature unless the inlet liquid is as low as that. Remember that entirely different pressures are to be expected if the system is charged with another refrigerant.

Now, if methyl chloride is used, different operating pressures are to be expected. The cut-out point on a pressurestat operating an ice cream cabinet charged with methyl chloride would probably be around the cut-in point for the same system charged with sulphur dioxide.

If more thought were given to an installation at the beginning, both from a sales and service angle, much of the heavy demand for service would be eliminated.

Factory Service School Offered by Electrolux

Evansville, Ind. — Seventeen Electrolux dealers were represented at the two-week factory school on gas refrigeration held here the early part of February.

In addition to the dealer service representatives, six Electrolux sales managers and two field service representatives were in attendance.

The representatives pictured here are as follows: (First row, left to right)—R. C. Bon Seigneur, district manager, Columbus; Gene McDonald, service representative, Kansas City, Mo.; H. J. Nachman, Washington Gas Light Co., Washington, D. C.; Seward Abbott, district manager, Washington, D. C.; R. J. Horns, Electrolux laboratory, New York City; W. C. Walker, Baltimore Consolidated Gas Co., Baltimore; R. B. Moore, factory school instructor; E. E. Hammett, Missouri Natural Gas Co., Farmington, Mo.; L. H. Wildridge, Washington Gas & Coke Co., Washington, Ind.; A. A. Beathe, Elizabeth Consolidated Gas Co., Westerfield, N. J.; G. W. Jenks, Lake Shore Gas Co., Ashtabula, Ohio; J. L. Shaffer, Northwestern Ohio Natural Gas Co., Toledo, Ohio.

(Second row)—C. G. Lant, Mt. Carmel, Ill.; E. J. Johnson, Owensboro Gas Co., Owensboro, Ky.; G. R. Copeland, district manager, Albany, N. Y.; A. E. Lee, district manager, Philadelphia; E. F. Kepke, Ohio Fuel Gas Co., Columbus; H. G. Leight, Ohio Fuel Gas Co., Mansfield, Ohio; C. J. Doyle, service representative, Albany, N. Y.; R. N. Lindgren, district manager, New York City; H. L. Stearn, district manager, Indianapolis; G. W. Brown, Indiana-Kentucky Natural Gas Co., Owensboro, Ky.; E. G. Wilson, Macon Gas Co., Macon, Ga.

BUFFALO FIRM APPOINTED LO-HED REPRESENTATIVE

Buffalo, N. Y.—Le Sauvage & Beardsley, Genesee Building, here, have recently been appointed as direct representatives for Lo-Hed monorail electric hoists in the districts of Buffalo and Rochester by the American Engrg. Co.

Weed & Co. will continue to distribute Lo-Heds in Buffalo and Rochester, cooperating with Le Sauvage & Beardsley.

PENN ELECTRIC SWITCH OPENS DETROIT OFFICE

Detroit—Penn Electric Switch Co., of Des Moines, Iowa, announces the opening of a new sales office in Detroit located in the General Motors Building.

Paul O. Penn has been appointed manager of the new Detroit sales office.

HARRY MYERS SPEAKS ON PLANT TIDINESS

Cleveland—At a recent meeting of the National Founders Association, held at Hotel Cleveland, Harry Myers, personnel manager of the Dayton Frigidaire plant, spoke on plant tidiness.

Coming Meetings, Conventions

American Institute of Electrical Engineers, district meeting, March 11 to 13, Pittsburgh. F. L. Hutchinson, 33 W. 39th St., New York City.

Illinois Gas Association Convention, March 12 to 13, Springfield, Ill.

American Chemical Society, eighty-first meeting, March 30 to April 3, Indianapolis.

Three-M-Congress. Management, Maintenance and Materials Handling Congress and Second National Industrial Equipment Exposition, April 13 to 18, in the Arena and Exhibit Hall, Cleveland Public Auditorium. Under auspices of the American Society of Mechanical Engineers, 29 W. 39th St., New York.

American Oil Burner Association, April 13 to 18, Benjamin Franklin Hotel, Philadelphia.

American Society of Mechanical Engineers, semi-annual meeting, April 20 to 23, Birmingham, Ala. Calvin W. Rice, 29 W. 39th St., New York City.

American Electrochemical Society, spring meeting, April 23 to 25, Hotel Tutwiler, Birmingham, Ala. Colin G. Fink, Columbia University, New York City.

American Society of Refrigerating Engineers, spring meeting, May 6 to 8, Hotel President, Kansas City.

National Electrical Manufacturers' Association, spring meeting, May 18 to 23, Hot Springs, Va. A. W. Berresford, 420 Lexington Ave., New York City.

National Electrical Credit Association, annual meeting, May 21 to 22, New York. Frederic P. Vose, 1008 Marquette Bldg., Chicago.

National Electrical Wholesalers' Association, spring convention, May 25 to 29, The Homestead, Hot Springs, Va.

Institute of Radio Engineers, annual meeting, June 3 to 6, Chicago. H. P. Westman, 37 W. 39th St., New York City.

National Electric Light Association, convention, June 8 to 12, Atlantic City, N. J. A. Jackson Marshall, 420 Lexington Ave., New York City.

BUSH
CONDENSERS
THE BUSH MFG. CO.
HARTFORD, CONN.
W. H. MARK HANNA
6-247 GENERAL MOTORS BLDG., DETROIT, MICH.

WE THINK YOU'LL BE INTERESTED IN THE ANSWER TO THIS QUESTION:

"How well does Temlok LOCK OUT HEAT?"

UNLESS trustworthy insulation guards your refrigerators, their efficiency goes down—current consumption goes up—food spoils—customers complain—and sales are lost.

You avoid these disasters when you install insulation that effectively resists the passage of heat. This is done *economically* with Armstrong's Temlok, the new low-cost fibre board insulation. How well? Temlok's conductivity is low—only .305 B. t. u. per square foot, per inch thickness, per degree Fahrenheit temperature difference, per hour, at 60° F. mean temperature.

Armstrong's Temlok has other qualities to recommend it. Based on the thirty-minute absorption test, as specified by the U. S. Bureau of Standards, Temlok's moisture absorption is less than 10 per cent—an exceptionally low amount. When you put Temlok in your refrigerators, you can be sure that this insulation will give efficient service.

Temlok is also light in weight. That's important to the refrigerator manufacturer. Temlok is rigid, too, and structurally strong; sterile and odorless. With all these advantages, Armstrong's Temlok is sold at a very reasonable cost.

Armstrong's Temlok, a low-cost fibre board insulation, has low moisture absorption, low conductivity; is light in weight, rigid, structurally strong, sterile, and odorless. It is supplied in sizes to meet your special requirements.

Today Armstrong is equipped to supply Temlok to refrigerator manufacturers in half-inch and solid-inch thicknesses, and in built-up layers as desired. In *any* thickness, it can be cut to size to provide custom-made board, quickly and economically installed.

We suggest that you write for complete information. We also will be pleased to send you samples. Write to: Armstrong Cork & Insulation Company, 917 Concord Street, Lancaster, Pennsylvania.

Armstrong's (A) Product

Armstrong's Temlok

LOW-COST EFFICIENT INSULATION FOR DOMESTIC REFRIGERATORS

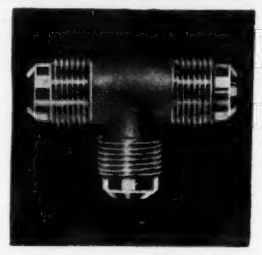
Silent...

Silent as a beast stalking its prey . . . Vibration-free because of spring mountings . . . Dependable . . . Trouble-free . . . These features make the Leland the best motor yet developed for electric refrigeration. Various fractional sizes.

The Leland Electric Co.
Dayton Ohio, U. S. A.

LELAND ELECTRIC CANADA, LTD
7-9 Duke St., Toronto, Canada

Seepage-proof Tees safeguard the reputation of the maker of the machine.

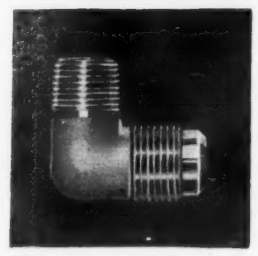


FORGED BRASS FITTINGS

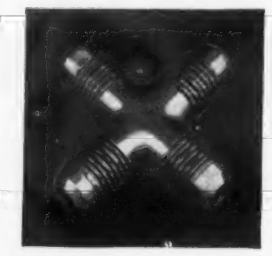
BUILT RIGHT TO STAY TIGHT

Quality is expressed by perfection in details. In fittings, for instance, the fact that every thread is accurately cut; that close tolerances are observed; that tube seats reach the installer without a nick or a scar; and that the basic material will confine refrigerants with no possibility of leakage.

For nineteen years users of Commonwealth fittings have learned to depend on them as "QUALITY" products; fit for any job.



Elbows, each of which is like its brother, make installation a pleasure.



Crosses, for multiple jobs, uniform on all branches to insure perfect assemblies.

Send for catalog No. 36, fully descriptive of the most complete line of refrigeration fittings on the market.

COMMONWEALTH BRASS CORPORATION
COMMONWEALTH AT G. T. R. R.
D E T R O I T

Highest **Filtrine** *Efficiency*
FILTERS & COOLERS

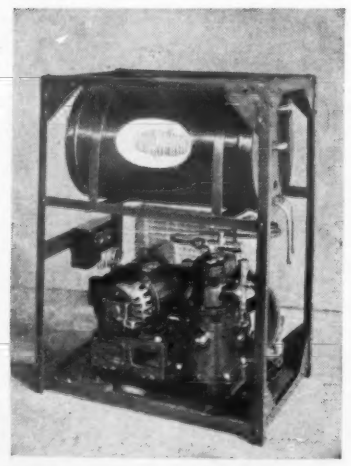
PURE, COLD WATER 24 HOURS A DAY . . . .

No. 1-C. Self-contained cabinet wtih filter-faucet. 23 in. wide, 16 in. deep, 45 in. high.

Filtrine offers a well-rounded line of Cabinet type coolers, Remote type coolers and complete circulating systems.

Filtrine was the first to employ the *direct contact,* pressure-storage method of cooling drinking water for electric refrigeration. The use of large storage tanks eliminates short-cycling-high head pressure—making it possible to deliver peak loads in excess of condenser hourly capacity. Pure, cold water is assured 24 hours a day.

Complete tanks with low sides for insertion in existing water coolers are now available.

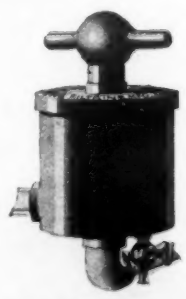


No. 4 Cooler. Illustration shows Remote type suitable for under the counter, for hanging on column or ceiling. Made in various sizes.

FILTERS

Every water cooler should have a Filtrine filter. Removes taste. Low priced. Easily installed.

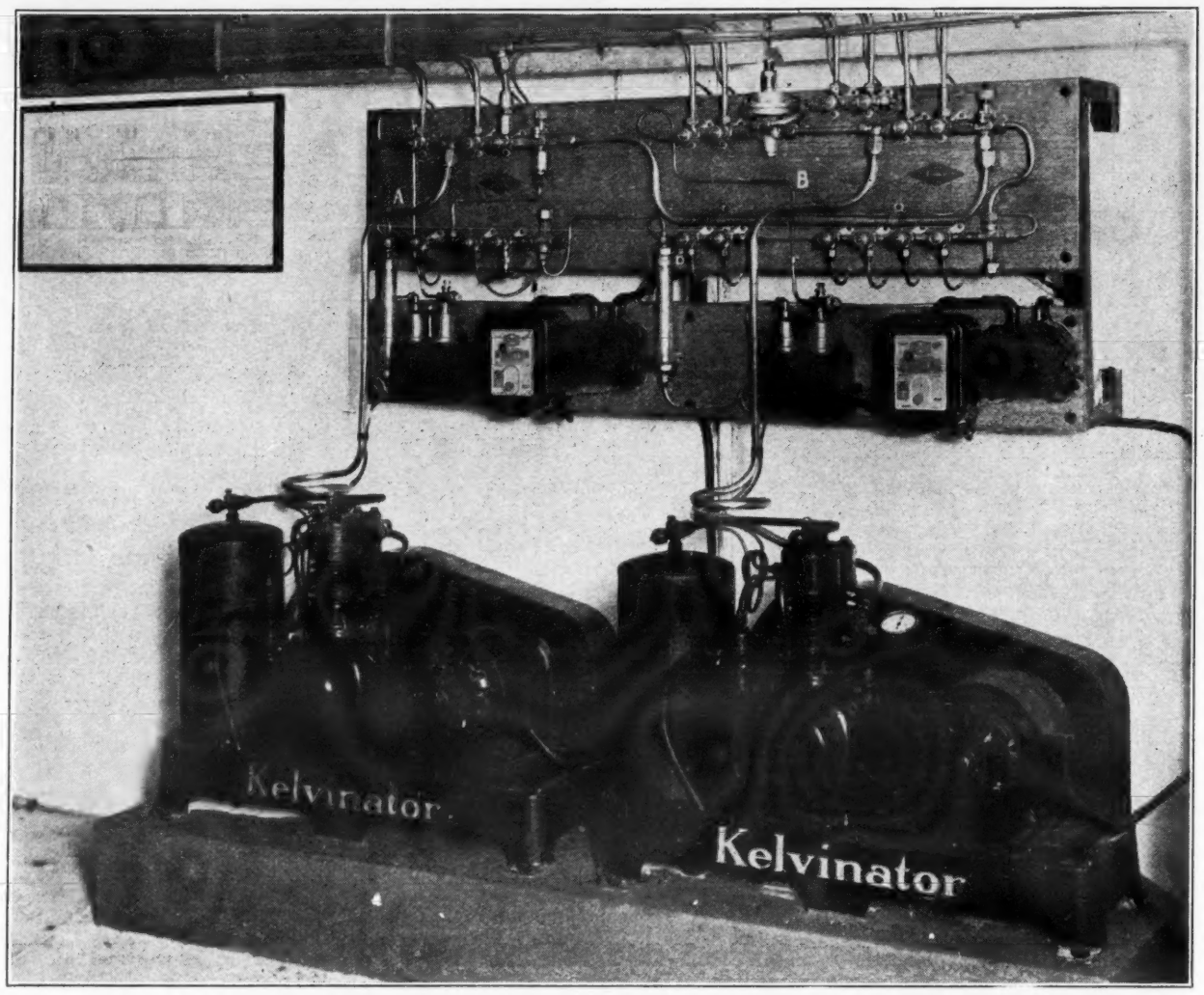
Filtrine Filters not only insure pure sparkling water, free from taste and odor, but also protect formation of sludge in compartment where Drinking water is cooled; thus protecting and prolonging the Cooler Efficiency.



No. 4 Filtrine Filter, small size, light weight and compactness permits installation either in Cooler or in the water supply line to the Cooler.

FILTRINE MFG. CO.
49 LEXINGTON AVENUE
BROOKLYN, N. Y.

Multiple Installation in Australia



Two condensing units installed by servicemen of Dangar, Geyde & Co., Sydney, in the Court House Hotel to cool beer and wine. The chart mounted on the wall shows the layout of the system.

SERVICE HINTS

By **FRANK W. GRAY**

Some service men quickly and effectively remove the oil from oil-logged coils operating in a flooded system in the following manner: The coil or "boiler," as it is commonly called, is loosened from its hangers and tipped sharply down at the front.

This allows the float ball to rise to the top of the boiler, flooding the coil, and washing the surplus oil through into the system. It is claimed by those who use this method that it is easier and more efficient than boiling out the oil by applying a cloth soaked with hot water to the bottom of the coil.

If a refrigeration system is correctly balanced, there should be little chance of service trouble through oil-logging of coils. When the service man frequently sees coils frosted only over the upper half, indicating that oil has settled in the bottom of the coil, he may be reasonably certain that there is a lack of refrigerant in the system.

A surplus of oil in the system, coils run in closed boxes where there is small heat leakage, poorly engineered suction line outlets on "boilers," are sometimes reasons for oil-logged coils. But the most frequent cause of all is a refrigerant-starved system. Which usually means—look for leaks!

Vibration in domestic electric refrigerators is not always due to faulty operation of the compressor. The smoothest running refrigerator, if placed upon an insecure or uneven foundation, will sometimes "telegraph" an annoying vibration.

If shock-absorber pads are used they should be placed beneath the compressor base in the box, rather than under the corners of the box itself, for the normal operation of the machine may cause the box to sway in harmony with its revolutions, causing the ice pans and receptacles in the refrigerator to rattle.

If the box is set squarely upon a solid floor, or directly above a floor beam if the floor is not solid, the vibration will be reduced to a minimum. Then, any running noise in the compressor can be eliminated by cushioning its base.

The most frequent cause of knocking in small compressors is caused by improper clearance of the discharge valve. Either too much or too little clearance will cause such knocking, the actual noise being made by oil passing through the valve.

When the connecting pipe from the compressor head to the condenser slants downward toward the compressor head, there is a tendency for the oil to run back into the compressor head when the machine shuts down and the pressure lessens. This causes a noise when the machine starts up again, due to a slug of oil being pumped over into the condensing coil.

Oil pounding in a compressor which has the spiral condensing coil usually comes from a pocket of oil forming in the center of the spiral when the machine shuts down. If the discharge pipe from the compressor head is connected to the outside, rather than to the center of the spiral, the oil will be more apt to distribute evenly, eliminating the pounding of pressure necessary to remove an oil pocket.

High head pressure on a system is often diagnosed by service men as caused by air in the system. Air in a system is usually indicated by a vacillating action of the pressure gauge needle. When the air is purged out of the system by cracking the valve on the compressor head, the machine should first be shut down for several minutes, allowing the pressure to let down and the air to collect at the top of the condenser.

Service men sometimes find that the liquid line is frosted back to the compressor. This condition usually indicates that a strainer or dryer in the liquid line is partially plugged up, and is acting as an expansion valve, or that there is a partial stoppage in the outlet orifice of the receiver.

When the liquid line is frosted or chilled, the service man may be reasonably certain that there is a partial stoppage somewhere ahead of the compressor, causing the refrigerant to expand before reaching the valves on the freezing units.

A chilled suction line is sometimes due to an over-size compressor on the job. A compressor which is too large for the job will pull the gas away from the boilers so rapidly that some of the unexpanded refrigerant comes through to the compressor, causing an annoying "sweating" of the tubing, which may be ruinous to the finish of walls or floors.

This condition can, of course, be remedied by replacing the compressor with a smaller unit. Or, in case it is not expedient to do this, the orifice of the compressor suction valve may be reduced, or the motor pulleys replaced by larger pulleys to run the machine at a slower speed, thus cutting down its capacity. Another alternate would be to valve the suction line, reducing the back flow of the gas.

When automatic expansion valves are used in a multiple system, together with float valves or "boilers," the back pressure on the automatic expansion valves should be set high so that the boilers will not run at too low a temperature.

In case it is still found that the float-valve-operated freezing units are too cold after raising the back pressure on the expansion valves, a pressure reducing valve may be used in the line between the direct expansion and flooded system to compensate for the difference in pressure and for further balance.

Where torches with a fine flame are desired for light soldering or brazing, old Prest-O-Lite gas tanks may be purchased from automobile salvage yards for little or nothing. The heads of these tanks may then be fitted with burner tips of the desired size to be used for torches where sharp flames are desired.

Service men should always take care to measure the amount of oil that is put into a refrigeration system. In many cases a compressor knock is superficially diagnosed as coming from lack of oil, and more oil is added indiscriminately.

In one case encountered by the writer, several different service men had worked at different times upon an apartment house system. When the majority of the boilers were found to be oil-logged, the system was pumped down and several buckets of surplus oil testified to the service methods that had been used.

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Savings that COUNT

Only with the best shafts at the lowest cost can your product meet 1931 competition. Get our prices. Let us show you savings you can *deposit in the bank.*

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MODERN MACHINE WORKS, INC.
156-160 No. Milwaukee St., Dept. D., Milwaukee, Wisconsin

REFRIGERATION RUBBER WARE

Door and Frame Insulating Strips. Gliders for Refrigerator Legs. Top Hole Sections, Lid Collars, Sleeves, Brine Hole Stoppers for Ice Cream Cabinets, etc. Specializing in Parts Made to Customer's Design.

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ASHTABULA, OHIO

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Ideal Heating & Refrigerating Co.
929 So. 22nd St., Birmingham

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Associated Refrigeration Service
4407 Sunset Blvd., Los Angeles
Joseph R. Beckman
2140 S. Alsace Ave., Los Angeles
California Refrigeration Service
Harry McConnell, John Barrett
4685 Hollywood Blvd., Los Angeles
General Refrigeration Service
E. L. Fabian
820 W. 11th, Los Angeles
Jack and George
1042 S. Western Ave., Los Angeles
Kemps Electric Refrigeration Service
7228 Beverly Blvd., Los Angeles
R. H. Knodell
1656 W. 25th, Los Angeles
Refrigeration Service, Inc.
3109 Beverly Blvd., Los Angeles
Refrigeration Specialists
H. E. Drews, Hal Knudson
1529 Hopkins St., Oakland
Servel Electric Refrigeration Service
W. E. Magoon
4145 Broadway, Oakland
R. H. Knodell
122 Marine St., Ocean Park
Electric Refrigeration Service
M. C. Bidwell
1500 N. E. Moline, Pasadena
San Bernardino Refrigeration Service
Ross A. Layne
270 11th St., San Bernardino
San Diego Refrigeration Service
R. L. Meyers
748 F. St., San Diego
Refrigerationon Maintenance Corp., Ltd.
104 Olive St., San Francisco
E. K. Wharton
1533 Pine St., San Francisco
Burgess Repair Shop
105 E. 3, Santa Ana
Modern Refrigeration Service
E. W. Greer
220 E. Noble, Stockton

Colorado

Refrigeration Service Co.
J. A. Smethills
1574 Milwaukee Ave., Denver

Connecticut

Hart Eddie Dist., Inc.
C. W. Hart, K. A. Eddie
308 Fairfield Ave., Bridgeport
Chas. E. Murphy, Jr.
14 Stedman St., Hartford
West End Electric Shop
M. W. Harte
405 West Maine, New Britten
E. B. Bidwell
2553 Whitney Ave., New Haven
D. D. Parshall
117 North St., Stamford
Connecticut Light & Power Co.
Waterbury

Delaware

Poole Electric Shop
9th and Market St., Wilmington

District of Columbia

W. J. Quinn
615 Otis Place, N. W., Washington, D. C.
Edwin J. Uhthoff
72 V St., N. W., Washington, D. C.

Florida

Squire's
Box 3251, Clearwater
Refrigeration Service Co.
536 Pine St., South Jacksonville
Automatic Electric Equipment Co.
209 W. Adams St., Jacksonville
Lloyd Odock
Box 1801, Lakeland
C. H. Tibado
Box 536, Lake Wales
O. Diemer
1130 S. W. 8th St., Miami
Val C. Thomas
P. O. Box 284, Palatka
General Refrigeration Co.
1700 Grand Central Ave., Tampa
Refrigeration Repairs & Supplies
2802 Tampa St., Tampa
Refrigeration Service Co.
401 East Hanna St., Tampa
Refrigeration Service & Supplies
102 East Warren Ave., Tampa

Georgia

D. W. Locklin
General Delivery, Athens
E. A. Jones
1400 Fair St., S. E., Atlanta
Mr. Powell
C/o J. B. White & Co., Augusta
A. R. Roles
Camilla
Hillhouse Hdwe. Co.
Sylvester

Illinois

Apex Refrigeration Service Co.
2311 North Monticello Ave., Chicago
Harry DeGan
7429 Rogers St., Chicago
Electric Refrigeration Co.
T. C. Johnson
4346 W. North Ave., Chicago
National Refrigeration Service Co.
43 E. Ohio St., Chicago
Refrigeration Maintenance Co.
23 West Kinzie St., Chicago
Lassers Furniture Co.
160 S. Schuyler St., Kankakee
Peoples Power Co.
Moline

Indiana

Oil Burner Service
W. L. Ranger
1128 Bresseau St., Elkhart
Refrigeration Service
428 Third Ave., Evansville
Gary Home Equipment Co.
137 West Ridge Rd., Gary
Electric Refrigeration Co.
4346 W. North Ave., Chicago
(Also furnishes services to Gary and Hammond, Ind.)
Northern Indiana Public Service Co.
Hammond
General Refrigeration Service
2341 Pierson Ave., Indianapolis
Frank E. Boyle
318 W. Franklin St., Kalamazoo, Mich.
(Also furnishes service to South Bend, Ind.)

Iowa

Anderson Electric Refrigeration Service Co.
817 Hull Ave., Des Moines
The Munn & Cassaday Co.
910 Grand, Des Moines

Kansas

Atchinson Blythes Electric Co.
117 W. 5th St., Atchinson
Giltner Repair Shop
1142 Quindaro Blvd., Kansas City

Kentucky

J. R. Grady
416 Philadelphia Ave., Covington

Maine

R. E. Moon
Box 732, Bangor
Portland Electric Co.
Ralph S. Norton
Street No. 38, Portland
Daniel O. Arsenault
18 Mill St., So. Bremer

Maryland

Grovnns Electrical Refrigeration Service
J. R. Mattes
5114 Craig Ave., Baltimore
Meyers Refrigeration Co.
2126 Edmondson Ave., Baltimore

Massachusetts

Refrigeration Service Co.
230-A Harvard St., Boston
Refrigeration Service Co.
C. E. Harris, V. J. Lawton
230 Harvard St., Brookline
Miller-Seddon Co.
302 Massachusetts Ave., Cambridge
The Tigar Corp.
211-213 Second St., Chelsea
K. R. Smith
18 Pear St., Fall River
Mystic Electric & Refrigeration Service Co.
66 Cotting St., Medford
Harold C. Lambert
31 Elm St., Springfield
Suburban Service Co.
A. W. Holton
81 Thornton St., Wollaston
Landin Electric Refrigerator Service
Carl H. Landin
28 Belmont St., Worcester
Pete's Electric Shop
Peter Pianowski
108 Ward St., Worcester

Michigan

Consumers Power Co.
Battle Creek
Auto Elec. Battery Shop
M. J. Jesswein
153 W. Main St., Benton Harbor
B I H Refrigeration Service
2947 St. Jean, Detroit
Electric Refrigerator Service
13234 Appoline, Detroit
Electric Refrigerator Service
J. W. Downs
10210 Plymouth Rd., Detroit
Frigerator Service Co.
10473 Northlawn, Detroit
A. J. Parent
12 Apple Grove St., Detroit
Snyder Electric Service
13300 Mack Ave., Detroit
Consumers Power Co.
Grand Rapids
Frank E. Boyle
318 W. Franklin St., Kalamazoo
Kalamazoo Refrigeration Service
318 West Frank St., Kalamazoo

Minnesota

Refrigeration Service Co.
A. A. Gartner
111 W. Michigan St., Duluth
Refrigerator Sales & Service Co.
Minneapolis

Missouri

Burke Refrigeration Service Co.
Joplin
Refrigeration Service Co.
J. M. Jackson, J. W. Anderson
3430 Michigan Ave., Kansas City
W. F. Schreiber
16 E. 16th St., Kansas City
Ace Hardware Co.
4051 Olive St., St. Louis
Evr-Kold Refrigeration Co.
321 South Grand Blvd., St. Louis
Mr. Philip Laventure
2819 North Taylor Ave., St. Louis
Oil Burning Engineering Co.
2605 Frederick Ave., St. Joseph

Nebraska

Shulenberger Service Station
Rosalie

New Hampshire

Sam's Second Hand Store
S. E. Lamotte
West Lebanon

New Jersey

Electric Refrigerator Service
2935 Carman St., Camden
Frezon Refrigeration Service
Mercerville

New Compilation

In response to many requests, the News is publishing on this page a list of independent service men. The foundation of the list was furnished by C. L. Olin, service manager of Servel, Inc., and additions were made by the Absopure Refrigerator Corp.

Service operators who are not represented here are invited to send in their names so the list may be made more complete. Supplemental information will be published as it is received.

Refrigeration Service & Engineering Co.
1305 Lombard St., Philadelphia, Pa.
(Also furnishes service to Camden, N. J.)
Brody Refrigeration Service
223 Orange Ave., Irvington
Anthony Rutkowske
312 Lincoln St., Phillipsburg
Frank Fell & Co.
128 E. Front St., Trenton
Russell W. Voorhees
505 13th St., West New York

New York

George Eager
57 Morris St., Albany
Select Refrigeration Co.
Gilbert Kuper, E. E. Dames
341 Rogers Ave., Brooklyn
Albert D. Reinecke
67 Northumberland Ave., Buffalo
S. E. Barber
Main St., Canton
Harold Holmberg
128 Bowen St., Jamestown
Hewitt & Warden
68 Broadway, Newburgh
Independent Electric Refrigeration Service
120 W. 18th St., New York City
Refrigeration Service Co.
449 W. 42nd St., New York City
Refrigeration Service Co.
360 Main St., E., Rochester
D. E. Electric Co.
Sunrise Highway & Chestnut St.
Rockville Centre
R. H. Darrah
91 Forrest Hill, Saranac Lake

North Carolina

P. H. Barfield
Calypso
W. B. Taylor
6 S. Brevard St., Charlotte
Central Garage
Kanansville
Littleton Supply Co.
Littleton
Kendall's Electric Refrigeration Service
R. E. Kendall
402 Cutler St., Raleigh
Thompson Electric Co.
132 Fayetteville St., Raleigh

North Dakota

Electro-Motive Repair Shop
S. E. Lund
111 First Ave., S. E., Minot

Ohio

John E. Taphorn
3200 Wold St., Cincinnati
Electric Refrigerator Exchange
5216 Euclid Ave., Cleveland
H. T. Kamman
3131 E. 94th St., Cleveland
B. H. Langhorst
962 Oxley St., Columbus
Dayton Power & Light Co.
20 S. Jefferson St., Dayton
The Gray Electric Co.
38 W. Fountain St., Springfield
Ohio Edison Electric Co.
Springfield
The Swan-Bower Co.
531 Market St., Steubenville
Edwin Reuger
128 Brunell St., Wauseon

Oklahoma

Southwestern Light & Power Co.
Chickashee
John Williams
C/o Southwestern Light & Power Co.
Okmulgee

Oregon

Carr Furniture Co., Inc.
LaGrange
Electric Refrigerator Sales & Service Co.
Lynn F. Smith
148 12th St., Portland
Reynolds & McKay
212 E. Broadway, Portland

Pennsylvania

L. A. Bettwy Plumbing & Electric Co.
840 17th St., Altoona
Philadelphia Electric Co.
Chester
Lloyd N. Bush
34 S. 14th St., Easton
Gallagher & Beck
522 Holland Ave., Erie
Wolfe Engineering & Sales Corp.
1136 Market St., Harrisburg
Murrman Electric Co.,
403 Clay Ave., Jeanette
B-K Engineering Co.
600 Market St., Kingston
Electrical Sales Co.
26 W. Chestnut St., Lancaster
Keystone Electric Repair Shop
362 S. 3rd St., Lehighton
Houston Hardware Co.
New Castle
Chas. F. Pitt Co., Inc.
Patton
Electric Refrigeration Repairs & Service
L. C. Jonas
1215 Summer St., Philadelphia
Electric Refrigeration Service Co.
6807 Ditman St., Philadelphia
L. C. Jones
1215 Summer St., Philadelphia
Quick Service Electric Co.
216 Stamwix Ave., Pittsburgh
Reading Refrigeration & Electric Co.
439 Schuykill Ave., Reading
W. H. Wagner
324 Chestnut St., W., Reading
V. A. Barrows
1438 Penn Ave., Scranton
Central Pennsylvania Equipment Co.
Williamsport

Rhode Island

Marsden's Store Fixture House, Inc.
30 James St., East Providence
Emile Scarbel
29 Spring St., Manville
American Electric Co.
1158 E. Main St., Providence
Electrical Sales & Service Co.
165 Friendship Ave., Providence

South Carolina

J. C. Snowden
Route 1, Charleston
B. C. Electric Co.
Columbia
B. M. Vise Co.
1817 Main St., Columbia

South Dakota

Lewis Asphalt Engineering Co.
Amil L. Cronholm, Ipswich
Herbert Akntholz
Tripp

Tennessee

R. L. Johnson
807 Orchard Knob, Chattanooga

Texas

J. A. Collier
205 W. 16th St., Amarillo
J. D. Dickson
1614 Stoneman St., Dallas
Fred B. Harlin
Itasca
E. S. Jeffries
Longview
Electric Refrigeration Service
A. A. Haney
1615 W. French, San Antonio

Vermont

Plunkett-Fuller Hdwe. Co.
Barton

Virginia

Hudson Morgan Electric Co.
521 Main St., Lynchburg

Washington

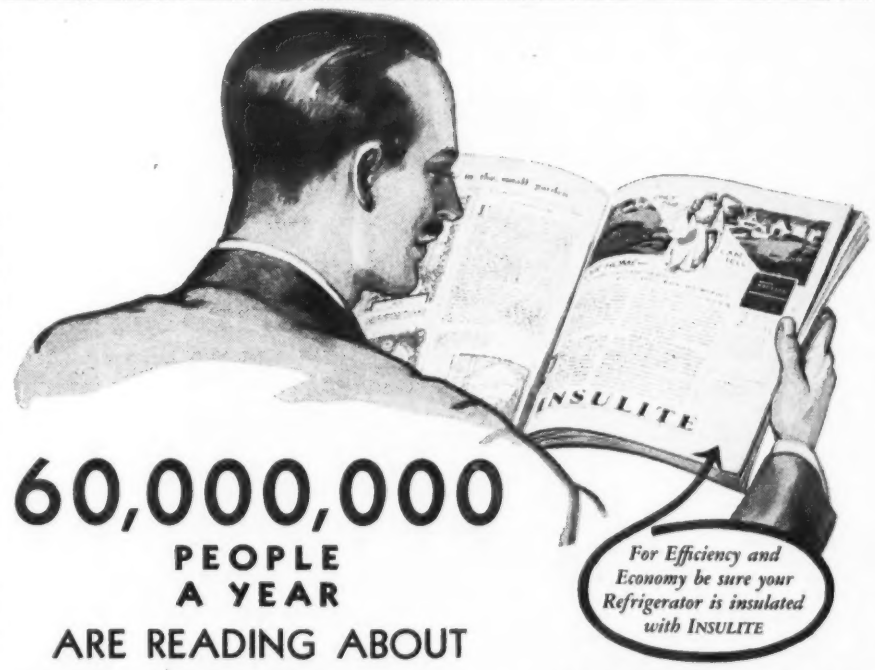
R. E. Lynch
2916 Beacon Ave., Seattle
Refrigeration Service Co.
823 W. Second Ave., Spokane
Yakima Hardware Co.
George V. Rankin, Yakima

West Virginia

Gill & Schadel, Inc.
Charleston
Mechanical Refrigeration Service
Roy McElhaney, Huntington

Wisconsin

Harry DeGan
7429 Rogers Ave., Chicago, Ill.
(Also furnishes service to Racine, Wis.)
Unity Refrigeration Service Co.
472 Reed St., Milwaukee
W. B. Hess
1633 Fleet St., Racine



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ELECTRICAL ENGINEERS MEETING AT PITTSBURGH

(Concluded from Page 1, Column 2)
fice Buildings," A. H. Kehoe and Bassett Jones; "The Primary Network," R. M. Stanley and C. T. Sinclair; "Operating Experience with Philadelphia A.-C. Network," H. S. Davis and W. R. Ross; prepared discussions.

Thursday, March 12, Morning—"Present Day Grounding Practices," committee, C. A. Powel, chairman; "Reactance of Transmission Lines with Ground Return," J. E. Clem; "Fundamental Basis of Distance Relaying," W. A. Lewis; "Power System Voltages and Currents Under Fault Conditions," R. D. Evans and S. H. Wright; "Simultaneous Faults and Six-Phase Transmission," Edith Clarke. Afternoon—Student session, addressed by President Lee.

Friday, March 13, Morning—"Conversion and Distribution of General Purpose D.-C. Power in Large Industrial Plants," R. D. Abbiss and D. C. West; symposiums on interconnection between utilities and industries, G. E. Dignan, R. L. Kirk, F. O. Schnure, A. Hoefle, and W. T. Woodmancy. Afternoon—Two papers on industrial power applications in annealing furnaces and dairy plants, respectively; from papers in field of communication.

NEW COMMERCIAL COILS DESIGNED BY FRIGIDAIRE

(Concluded from Page 1, Column 2)
coil temperature is above freezing for a longer period than was possible with the old type coils, thus making defrosting faster and more certain."

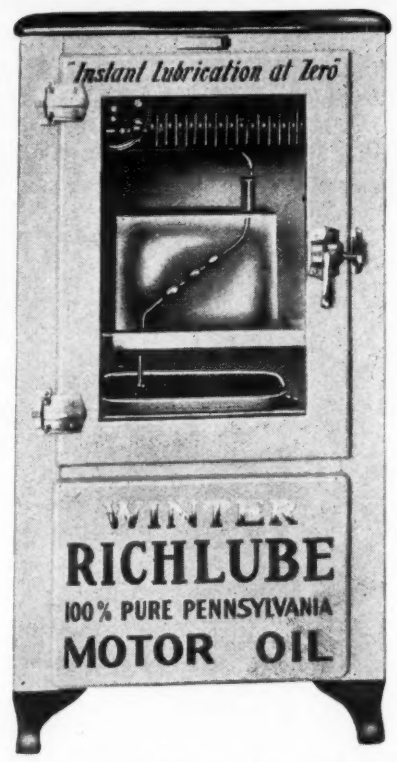
In describing the new compressors which comprise part of the new commercial line, Mr. Vandoren stated, "The compressors have greater capacity, and are designed for higher efficiency.

"Forged steel connecting rods with adjustable type bearings are lined with Babbit metal. The crankshaft is a steel forging, heat treated, drawn, and all bearing surfaces hardened. Main shaft bearings are extra-heavy Durex metal. Patented, semi-balanced type bellows seal the driving shaft."

Special Equipment Cold Tests Oil

New York City—Electric refrigeration is being used by the Richfield Oil Corp., of this city, to demonstrate the flowing qualities of oils at low temperatures.

The Water Cooler Department of the New York Kelvinator Branch, under the supervision of C. V. Hoeflich, has equipped five standard Kelvinator Yukon 5 cu. ft. cabinets with triple glass doors and special commercial equipment, for display purposes.



A glass tube is frozen in a cake of ice, and oil is circulated from the pump at the bottom of the cabinet underneath the ice cake through the tube.

The low temperature demonstrations were put on at the Grand Central Palace during the New York automobile show in January, and at the Baltimore, Md., and Oneida, N. Y., auto shows.

KANSAS GAS CO. HOLDS ELECTROLUX FIELD SCHOOL

Kansas City, Mo.—Sponsored by the Kansas City Gas Co. an Electrolux field school was held here January 26 to January 30, under the instruction of R. B. Moore, of the factory school.

A total of 39 men registered for the short course, including members of the Kansas City Gas Co. and the Wyandotte Gas Co.

The complete roll call of the school was as follows: H. L. Bradly, E. Swarzenholz, C. Holmgren, C. E. Hursig, W. E. Tracy, P. C. Ford, J. A. Rigdon, D. A. Percell, S. B. Moberly, C. Coleman, C. G. Forbes, W. P. Hunt, A. C. Hester, A. B. Rhodes, C. O. Peters, W. O. Hiat, A. R. Shepherd, G. H. Knepp, J. C. Rewis, W. Gall, J. J. Mayes, J. U. Hoopes, D. F. Baldwin, R. F. Brobst, F. E. Williams, J. J. Brown, C. C. Sturdivant, E. G. Ernst, E. B. Rose, P. C. Townsend, S. C. Coy, J. R. Coots, W. Wells, W. Wilson, S. M. Stover, B. A. Stockton, A. L. Grim, W. B. Branel, C. A. Bellinger.

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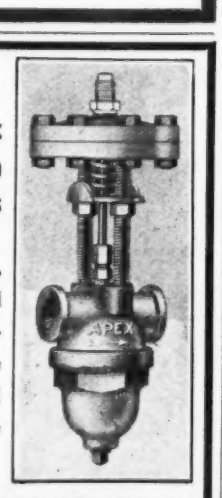

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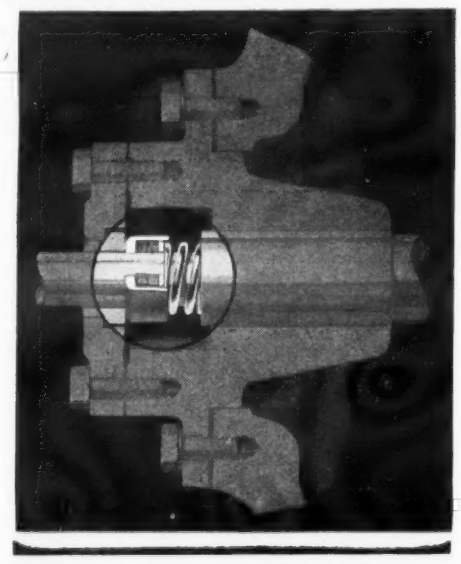

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California Service Men Discover 'Jonah' Commercial Installations

By Frank W. Gray

EVERY service engineer has known some "Jonah" jobs that would not seem to respond to service treatment. The writer describes here a few such "puzzlers" that have come within his own experience.

Some time ago an organization in Los Angeles was installing a large commercial job. The installation was located in a large food market, at some distance from the city. Six refrigerated display counters were to be operated by a sulphur dioxide multiple system, the compressor operating the job being placed in the rear end of the building, on the same floor with the display counters.

The service crew went to work, and soon had the compressor placed, the electrical work completed, and the freezing coils installed in the counters. The tubing lines were run through two trunk lines of conduit, cemented into channels in the concrete floor, three display counters being operated in parallel, from each trunk line.

When the job was started up, a peculiar condition at once manifested itself. The compressor was found to be developing an abnormally high head pressure of about 175 pounds.

When the first service call was made the two display counters at the extremities of the conduit "runs" were found to be operating satisfactorily, while the four counters nearer to the compressor were defrosted.

The service men decided that the high head pressure on the compressor was due to air being present in the system. They purged the compressor head to remove the air, and immediately got a strong odor of sulphur, indicating that there was no air present in the condensing coil.

Add Sulphur Dioxide

They then decided that the trouble was due to lack of refrigerant, and added several pounds of sulphur dioxide. This additional charge apparently relieved the situation. The display counters all frosted up, and the men left the job satisfied that they had solved the difficulty.

A day or so later another service call came in from the proprietor of the shop. He stated that the machine was pounding like a pile driver, and that four of his counters were again defrosted.

When the service men answered the call they found the same conditions prevailing as before, only this time the head pressure on the machine was over two hundred pounds, and the belts were practically burned up from operating at this pressure. They next decided that the trouble was stoppage in the automatic expansion valves with which the cooling coils in the cases were being operated. They tested the valves, and found them to be working perfectly.

They then looked for oil traps, again purged the air, let out part of the refrigerant charge to reduce the head pressure, and did everything else that service precedents dictated. But the job seemed to be going from bad to worse.

Then another curious thing happened: When the men went back to the job the next morning it was operating perfectly, with normal head pressure, and all cooling coils frosted. It continued this way for about a week. Then the proprietor of the market again called up and expressed his opinion of the installation in no uncertain terms.

The writer at this time went out to inspect the job with a service engineer. After confirming the tests that the other service men had made, and checking the compressor in every way possible, we began looking for some other cause for the difficulty.

Stove Heats Refrigerant

We found in the rear of the shop, near the compressor, a huge iron stove which the proprietor used for cooking up large batches of foodstuffs, had been moved directly over a place on the concrete floor where our conduit had been cemented into a channel. The heat from the stove was causing the refrigerant in the liquid line to expand to a very high pressure, making the machine pound and knock, and sending hot gas to the first four display counters.

The fact that the two furthest counters had been getting refrigeration was due to their being at such a distance from the source of heat that the refrigerant had time to partially condense again before reaching them. And the fact that the system had operated perfectly for an interval of several days was because the cooker was out of use during this period.

Sheets of asbestos were laid beneath the stove, insulating the heat from the conduit lines. Immediately the head pressure dropped, the display counters cooled down to temperature, and no further trouble was experienced with this installation.

Another Puzzling Job

This installation was also a multiple system using sulphur dioxide. It was installed in a butcher shop, and consisted of a large fin-type cooling unit placed in a 10 by 12 ft. meat cooler, and two heavily coiled display cases located near the front of the store. All cooling units were operated with automatic expansion valves.

In each case the vertical surface area of the cooling units was estimated at 100 per cent of the surface area of the box or case it refrigerated, in order to operate the whole job on a defrosting cycle.

When the job was put into operation, the display counters were found to be holding a temperature of about 30 degrees each—which was too cold—while the box was much too warm at 48 degrees.

The service men raised the pressure adjustment on the expansion valves in the counters. This partly alleviated the difficulty, but it was still found that the system was not correctly balanced up, the large box still being too warm.

Then the automatic control bulbs, or "pig tails," on the expansion valves were moved back until only about two-thirds of the cooling unit capacity in each display counter was being used. After this had been done, the large refrigerator cooled down to temperature, and the counters worked perfectly.

In engineering jobs of this direct expansion type the various cooling units should be synchronized with each other as to capacity.

This job is located in a town in California where heat conditions are very severe during the summer time. The above described adjustments were made during the winter months. When summer conditions prevail this adjustment may have to be changed to conform to higher heat leakage in the display counters in relation to the larger cooler.

Galvanized Risers Cause Trouble

Another puzzling service condition presented itself in the case of display counter installations using galvanized iron pipe "risers." A number of such installations were put into a large western city. The "risers" were simply galvanized iron pipes, one and one-half inches in diameter, running across the upper front section of the display counters for frosted display purposes, curving down at each end into horizontally looped coils which refrigerated the middle section of the counters.

Of course, the principal source of refrigeration value in such an installation is from the large coil surface in the middle section, rather than from the single pipe "riser" which runs to the top of the case and along the front. The butchers in this locality, however, seemed to prefer this frosted riser pipe for display purposes. This meant that the pipe must be evenly and constantly frosted, or the display value was lost.

An automatic expansion valve installation was used. It was found that a number of these "riser" pipes simply could not be kept evenly frosted. The curious aspect of the matter was that the "riser" pipes would defrost in patches, without apparent rhyme or reason. A section in the middle might be bare, while both ends of the pipe would be completely frosted. The pipes underneath were chilled, and the counters down to proper temperature, while the machines were running perfectly, so it was clearly a case of some condition in the "riser" itself which prevented even frosting.

Ample provision had been made to have sufficient liquid refrigerant in the "riser" pipes when the machine was shut down. This was done by running the liquid intake tube nearly to the top of the "riser" pipe, allowing the liquid refrigerant to pour down out of the intake and fill the "riser" and pipes below.

After experimenting with these jobs for some time, it was finally discovered that rough surfaces on the inside of the galvanized riser pipes caused a skin of oil to form over these patches, defrosting the pipes at these points by insulating them against heat transfer.

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LATEST REFRIGERATION PATENTS

ISSUED FEBRUARY 13

1,792,628—ABSORBENT FOR REFRIGERANTS. Ralph M. Buffington, Dayton, Ohio, assignor to Frigidaire Corporation, Dayton, Ohio, a Corporation of Delaware. Filed June 27, 1929. Serial No. 374,286. 6 Claims. (Cl. 252—5.)

1. An absorbent for ammonia in refrigerating apparatus of the absorption type consisting of a mixture of strontium chloride and ammonium nitrate.

1,792,649—REFRIGERATING MECHANISM. Fred B. MacLaren, Malba, N. Y., assignor to The MacLaren Electric Appliance Corporation, New York, N. Y., a Corporation of Delaware. Filed July 24, 1923. Serial No. 653,467. 4 Claims. (Cl. 62—98.)

1. In a refrigerating apparatus, a container having a refrigerating compartment, an air compressor adapted to draw air from said container, means to cool the compressed air comprising an air radiator carried by said container, means to further cool said air by the air drawn into said compressor, an expansion motor of smaller size than said compressor operated by said compressed air, an exhaust valve for said motor, means to deliver the expanded air from said expansion motor to said refrigerating chamber, means to muffle the air so delivered, and means to widely distribute the delivered air in said refrigerating compartment.

1,792,748—REFRIGERATOR DISPLAY CASE. Charles B. Longstreth, Denver, Colo. Filed Sept. 23, 1929. Serial No. 394,446. 4 Claims. (Cl. 62—89.5)

1. A refrigerator display case having a bottom and a rear wall and end walls formed in part from heat insulating material, the top and front side being composed mainly of glass, the inner surface of the bottom and the rear wall having a metal lining, the rear portion of the bottom and the lower portion of the rear wall forming respectively the bottom and one side of a chamber of which the top and other side are formed from a metal sheet whose edges are connected with the metal lining of the bottom and the rear wall whereby an elongated compartment is formed for the reception of the cooling coils and whereby two separate supporting surfaces are formed on different levels, the rear surface being higher than the front surface.

1,792,786—SEALING MEANS. Harry J. Walker, Lorain, Ohio, assignor to The Lorain Automatic Icer Company, Lorain, Ohio, a Corporation of Ohio. Filed Oct. 26, 1928. Serial No. 315,315. 2 Claims. (Cl. 286—7.)

1,792,891 — TEMPERATURE - CONTROLLED VALVE. Walter B. Clifford, Cambridge, Mass. Filed Sept. 23, 1927. Serial No. 221,572. 3 Claims. (Cl. 236—99.)

1,792,945—VALVE. Francis M. Van Deventer, Los Angeles, Calif. Filed Nov. 18, 1926. Serial No. 149,081. 4 Claims. (Cl. 251—46.)

1,793,019—EXPANSION VALVE FOR REFRIGERATING SYSTEMS. Albert F. Sawyer, Haverhill, Mass., assignor to Irving L. Keith, Haverhill, Mass. Filed Sept. 22, 1928. Serial No. 307,630. 4 Claims. (Cl. 50—26.)

1. An expansion valve comprising a casing having an inlet port and an outlet port respectively adapted for connection to the high pressure side and to the low pressure side of a closed circuit refrigeration system, a valve stem reciprocally movable within the casing and having a valve at one end, to be moved against the pressure applied to said inlet port to close the same, a spring adapted and arranged to engage said stem and hold said valve closed against the normal fluid pressure supplied to said inlet port and to yield to permit the valve to be opened by an abnormal pressure supplied thereto, a pressure controlled device on said casing arranged to be moved outwardly to an inoperative position by the pressure within the casing when raised to a predetermined point and to be moved inwardly from said position when said pressure is reduced below said point, and engaging means between said device and said stem arranged to move said stem to open said inlet port when said device is moved inwardly.

1,793,287—REFRIGERATING DEVICE. David Forbes Keith, Toronto, Ontario, Canada. Filed July 26, 1928. Serial No. 295,548. 7 Claims. (Cl. 62—120.)

1. In a refrigerating device of absorption type, a generator-absorber casing, a condenser-evaporator casing, passageways between them including a seal, and means for retaining a cooling liquid in direct contact with the generator-absorber casing about that portion thereof through which the generated gas passageway extends, and an alarm for indicating the completion of a generation cycle associated with said means.

1,793,292—PRESSURE - REGULATING VALVE. Halsey W. Taylor, Warren, Ohio. Filed Aug. 1, 1928. Serial No. 296,745. 11 Claims. (Cl. 50—23.)

1. A pressure regulating valve, comprising a body having a fluid passage and valve seat, including a spring-operated self-closing valve member for said seat, manually-operable means for unseating said valve member including a spring counteracting the spring of said valve member, and means operable by the pressure of the fluid for shifting the position of said valve member relatively to its seat independently from said counteracting spring when said manually operated means have been actuated to unseat said valve member.

ISSUED FEBRUARY 24

1,793,853 — REFRIGERATOR APPARATUS. Harry B. Hull, Dayton, Ohio, assignor, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware. Filed Oct. 3, 1923. Serial No. 666,218. 22 Claims. (Cl. 62—115.)

1. A refrigerator unit comprising, in combination, a platform, a condenser and a compressor mounted upon the platform, a receiver mounted underneath the platform, pipes supported by the platform and supporting the receiver, said pipes providing connections with the condenser and with an expansion chamber.

1,793,857 — REFRIGERATING APPARATUS. Charles F. Kettering and Otto M .Summers, Dayton, Ohio, assignors, by mesne assignments, to Frigidaire Corporation, a Corporation of Delaware. Filed Aug. 19, 1926. Serial No. 130,242. 3 Claims. (Cl. 62—4.)

1. A refrigerating system comprising, in combination, a cooling unit having an opening; means for circulating a refrigerant medium through said unit; mechanism for controlling said means; a circuit for controlling said mechanism; a container insertable through said opening and having an opening accessible from the exterior of said unit; and a switch carried within said container and responsive to the temperature of said unit for controlling said circuit.

1,793,873—HEATING APPARATUS. Folke Emil Sellman, White Plains, N. Y., and William D. Collins, Evansville, Ind., assignors, by mesne assignments, to Electrolux Servel Corporation, New York, N. Y., a Corporation of Delaware. Filed Apr. 26, 1929. Serial No. 358,213. 10 Claims. (Cl. 122—156.)

1. In a liquid heating device, a fluid container, a flue for heating said container, means to attach a burner to and concentric with said flue and means permitting the adjustment of said burner varying distances from said flue.

1,793,954—THERMOSTATIC APPARATUS. Joseph W. Myers, Jackson, Mich. Filed May 16, 1927. Serial No. 191,621. 6 Claims. (Cl. 200—122.)

1,794,028—PRESSURE-CONTROL SYSTEM. Thomas A. Peebles, Pittsburgh, Pa., assignor to John M. Hopwood, Dormont, Pa. Filed Jan. 25, 1928. Serial No. 249,481. 12 Claims. (Cl. 122—479.)

1,794,030 — REFRIGERATING MACHINE. George H. Phelps, Warehouse Point, Conn., assignor, by mesne assignments, to Metropolitan Engineering Company, a Corporation of New York. Filed Feb. 21, 1927. Serial No. 169,690. 6 Claims. (Cl. 62—95.)

1. A radiating unit for refrigerating machines including in combination vertical plates and horizontal plates forming the walls of a freezing compartment, means for attaching said compartment to the cooling element of the machine and a radiating structure of sheet metal attached to said compartment.

1,794,110—ACCUMULATOR AND TANK-COIL SYSTEM FOR REFRIGERATION. Norman H. Gay, Los Angeles, Calif. Filed Sept. 9, 1929. Serial No. 391,409. 3 Claims. (Cl. 62—126.)

1. In a refrigerating system, a vertical accumulator having inlet and outlet header extensions projecting horizontally therefrom, evaporator coils connecting said headers and providing means for a free circulation of liquid refrigerant through the coils, outlet header, accumulator and inlet header, said inlet header having a baffle therein dividing the same into two compartments and extending from one end substantially to the other end of said header, an inlet line for liquid refrigerant opening into said inlet header beneath said baffle at a point substantially above the bottom of said inlet header, and an oil withdrawal line opening into said inlet header adjacent the bottom thereof.

1,794,185—DISCHARGING APPARATUS FOR COMPRESSED GAS. Renée Marie-Louise Lemoine, née Trouillet, La Buissonniere, near Perriers - on - Andelle, France. Filed Sept. 8, 1927. Serial No. 218,270, and in France Oct. 29, 1926. 4 Claims. (Cl. 62—92.)

1. A discharging apparatus of the character described, which comprises a compressed gas container and successive expansion devices interposed between the compressed gas container and the gas discharge orifice, and plugs of porous material impregnated with a liquid having a low freezing point disposed in said expansion devices at the points therein which are most exposed to freezing.

1,794,281—LIQUID FILTER. Anton L. Dorfner, Philadelphia, Pa. Filed June 12, 1929. Serial No. 370,387. 6 Claims. (Cl. 210—178.)

1,794,336—HEAT - EXCHANGER APPARATUS. George T. Jacocks, Larchmont, N. Y., assignor, by mesne assignments, to Alco Products Incorporated, New York, N. Y., a Corporation of Delaware. Filed July 6, 1929. Serial No. 376,296. 8 Claims. (Cl. 257—219.)

ISSUED MARCH 3

R-17,989—COOLING UNIT. Jonathan P. B. Fiske, Newton, Mass., assignor, by mesne assignments, to Kelvinator Corporation, Detroit, Mich., a Corporation of Michigan. Original No. 1,632,283, dated June 14, 1927, Serial No. 448,549, filed Feb. 28, 1921. Application for reissue filed Jan. 26, 1928. Serial No. 249,755. 4 Claims. (Cl. 62—116.)

3. In refrigerating apparatus, the combination of a portable housing assembled and movable as a unit, said housing having heat-insulating walls and upper and lower chambers and the exterior walls of said lower chamber having openings at different levels for the entrance and exit of air, refrigerant liquefying mechanism enclosed in said upper chamber, a vaporizer in said lower chamber, means connecting said mechanism and vaporizer for the circulation of the refrigerant, and thermally controlled means for controlling the flow of air through one of said openings.

4. In combination with a refrigerator cabinet, a self-supporting self-contained refrigerating apparatus comprising a casing provided with a partition dividing it into superposed compartments, one of said compartments being heat insulated, a compressor condenser means mounted in said insulated compartment, a refrigerant vaporizer mounted in the other compartment, and refrigerant conduits interconnecting said vaporizer, and said compressor condenser means, said apparatus being movable into and out of said cabinet without disturbing said conduits.

1,794,394—WATER-COOLING TOWER. Carl F. Braun, Pasadena, Calif., assignor to C. F. Braun & Co., Alhambra, Calif. Filed Sept. 14, 1928. Serial No. 306,063. 7 Claims. (Cl. 261—109.)

1,794,422—FLOOD VALVE. Sherman Shaul, Williamsburg, Iowa. Filed Nov. 7, 1929. Serial No. 405,455. 2 Claims. (Cl. 137—69.)

1,794,454—SEALING RING FOR ROTATING MACHINES OR CYLINDERS. Burnett E. Green, Alpena, Mich., assignor to Huron Industries, Inc., Alpena, Mich., a Corporation of Michigan. Filed Sept. 8, 1928. Serial No. 304,830. 7 Claims. (Cl. 286—7.)

1,794,483—COOLING COIL. Francis W. Shepherd, Salt Lake City, Utah, assignor of one-half to Perry A. Clark, Salt Lake City, Utah. Filed Aug. 11, 1928. Serial No. 298,963. 3 Claims. (Cl. 62—95.)

1. In a cooling system for beverages the combination of a cover plate, a casing secured on the inner side thereof; a coil having one end secured in open connection with said casing and the other end bent outwardly and secured to the cover plate; another casing secured within said first mentioned casing; a coil of pipe of smaller diameter than the first mentioned coil carried therein and having one end secured to said last mentioned casing above the bottom thereof and the other end passed upwardly and out through the top end of said first mentioned coil; a pipe connecting said second mentioned casing with the outlet pipe of a refrigerating system; a valve in said connection to control the flow of liquid therethrough; and another valve connecting the refrigerating system with the free end of said inner coil.

1,794,692 — CONDENSER. Rollin M. Hyde, Detroit, Mich., assignor to McCord Radiator & Mfg. Co., Detroit, Mich., a Corporation of Maine. Filed June 14, 1928. Serial No. 285,292. 4 Claims. (Cl. 257—247.)

1. A condenser for refrigerating systems, comprising a group of tube sections, each section consisting of inner and outer tubes having relatively thin walls for the rapid transfer of heat therethrough, and coupling members at the opposite ends of the tube sections for alternately connecting them together in a manner to provide a double flow passage therethrough, said coupling members having complementary tapered portions to engage and expand the tube ends engaged thereby to make tight joints between the tubes and the members on clamping the latter together.

1,794,765 — WATER-SOFTENING APPARATUS. Walter H. Green, Chicago, Ill., assignor, by mesne assignments, to International Filter Company, Chicago, Ill., a Corporation of Delaware. Filed June 13, 1927. Serial No. 198,598. Renewed Sept. 15, 1930. 12 Claims. (Cl. 210—24.)

1,795,201—PRESSURE REDUCING AND REGULATING VALVE. Frank Dashwood, Dunnville, Ontario, Canada. Filed May 2, 1928. Serial No. 274,623. 1 Claim. (Cl. 50—23.)

A wholly automatic pressure reducing and regulating valve comprising a casing, a diaphragm extending across said casing and dividing it into lower and upper chambers, a diaphragm supporting plate contained within the lower chamber, and upon which the diaphragm rests, a portion extending centrally from the lower face of the casing and having a passage extending therethrough also inlet and outlet orifices for the flow of gas, a reciprocal hollow valve stem contained within the passage and secured at its upper end to the diaphragm supporting plate, a valve seat formed around the inlet opening underneath the bottom of the stem, a flat faced valve face formed upon the lower end of the stem and adapted to co-act with the valve seat, and a second diaphragm contained within the lower chamber across the entrance to the passage in the extending portion and positioned between the inner bottom face of the lower chamber and the bottom face of the diaphragm supporting plate.

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